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ENTRIES 1324–1852

AGRONOMY

C. V. PIPER, *Editor*

1324. ANONYMOUS. **El arroz.** [Rice.] Informacion Agric. [Madrid] 9: 200–201. 1919. —Compilation of statistics of rice production for the world, chemical composition, value as a food, and rice-induced diseases.—*John A. Stevenson.*

1325. ANONYMOUS. **Materias grasas de los desperdicios del descascarillado del arroz.** [Fats from rice hulls.] Informacion Agric. [Madrid] 9: 202–203. 1919.—75,000 quintals of oil are produced annually from rice by-products in Italy. This is used for soap, glycerine, and other similar products.—*John A. Stevenson.*

1326. ANONYMOUS. **El trigo.** [Wheat.] Informacion Agric. [Madrid] 9: 1–4. *2 fig.* 1919. —Considers the importance of wheat as a food, a comparison of it with other cereals in this respect, the consumption in various countries, prices, and a method for determining the grade of wheat flour.—*John A. Stevenson.*

1327. ANONYMOUS. **Nomenclature of wheats grown in South Africa.** Union of South Africa, Dept. Agric. Bull. 1 (Gen. Ser.). *16 p.* 1919.

1328. ANONYMOUS. **Varieties and strains of corn for Connecticut.** Connecticut [New Haven] Agric. Exp. Sta. and Storrs [Connecticut] Agric. Exp. Sta. Joint Bull. 2. *17 p.* 1919. —A report of progress.—*M. F. Abell.*

1329. ANONYMOUS. **Maize experiments at the School of Agriculture and Experimental Farm, Potchefstroom.** (Progress Report.) Union of South Africa, Dept. Agric. Bull. 81 (Local Ser.). *11 p. Pl. 1–3.* 1919.

1330. ANONYMOUS. **Economic grasses.** Agric. Jour. South Africa 9[40]: 24–27. 1919.

1331. ANONYMOUS. **Las cenizas en el cultivo pratense.** [Ashes for clover growing.] Informacion Agric. [Madrid] 9: 204. 1919.—The value of ashes for clover and grasslands, because of their potash and lime content, particularly when mixed with phosphate, is considered.—*John A. Stevenson.*

1332. ANONYMOUS. **Dos nuevas suertes de guisante de los campos obtenidas por seleccion en descendencias puras, en Noruega.** [Two new types of field peas obtained by selection in Norway. Informacion Agric. [Madrid] 9: 11–12. 1919.—A review of work carried out in Norway. (Source of information not cited.)—*John A. Stevenson.*

1333. Anonymous. **Flue curing lemon bright tobacco leaf.** Jour. Dept. Agric. Victoria 17: 377–378. 1919.—The varieties giving best results by flue curing are Spotted Gum and Yellow Pryor.—*J. J. Skinner.*

1334. Anonymous. **Procedimiento para hacer germinar las semillas de difícil germinacion. [A method of germinating hard seeds.]** Informacion Agric. [Madrid] 9: 11. 1919.—Hot water at 50°–70°C. is recommended, the temperature varying with different types of seed.—*John A. Stevenson.*

1335. Anonymous. **Conveniencia economica de la plantacion de arboles en las praderas. [Economic advantage of tree plantations on prairies.]** Informacion Agric. [Madrid] 9: 109–110. 1919.—A review of experiments conducted on the plains of Russia in growing legumes and other crops continuously and in rotation with trees. (Original source of information not cited.)—*John A. Stevenson.*

1336. Anonymous. **The world and its food shortage. Part XI.** Tropical Life 15: 37–38. 1919.—A compilation discussing the value of the groundnut peanut (*Arachis hypogaea*) as a human food. A standard article called "nutramine" is made from the cake after the oil content has been lowered to about 5 per cent by first grinding the cake finely in an ordinary roller mill and then sieving the flour. This nut flour or "nutramine" is prepared for consumption usually by mixing it with wheat flour.—*H. N. Vinall.*

1337. Anonymous. **Sisal for selling. VI.** Tropical Life 15: 18–19. 1919.—A compilation discussing the kind of soils suited to the production of sisal. It is noted that sisal grows well on the Caicos Islands (attached administratively to Jamaica). The true sisal (*Agave sisalana*) was found growing there as early as 1889 and producing a fibre equal to the best Yucatan. The most productive sisal soil in these islands is that in which the geological foundation is wholly limestone.—*H. N. Vinall.*

1338. Anonymous. **Sisal for selling. VII.** Tropical Life 15: 34–35. 1919.—A compilation discussing the "Proposed Manurial and other Experiments for Sisal Plants in the Turks and Caicos Islands." The yields on the Caicos Islands are compared with those of Yucatan.—*H. N. Vinall.*

1339. Anonymous. **Sisal for selling. VIII.** Tropical Life 15: 67–68. 1919.—A discussion of soils and climates suited to sisal production, being a compilation of material from the article by Lyster Dewey on "The Principal Commercial Plant Fibres," in U. S. Dept. Agric. Yearbook 1903, and Bull. 4 Agric. Exp. Sta. of Hawaii by Frank E. Conter, 1903.—*H. N. Vinall.*

1340. Anonymous. **Sisal for selling. IX.** [Rev. of: Hoffmann, A. Tropicale Madagascar 19: 219–226. 1918.] Tropical Life 15: 86–87. 1919.—Contains instructions for the establishment of a nursery, also outline of a scheme for a sisal plantation in Madagascar. Mr. Hoffmann estimates that a capital of 200,000 francs is needed for a 200 hectare plantation on which a profit of 500 to 600 francs per hectare per year might be expected. A list of the known species of *Agave* is given with a short statement regarding the climatic and soil adaptations of each.—*H. N. Vinall.*

1341. Anonymous. **Guinea corn as a fodder crop.** Agric. News [Barbados] 18: 103. April 5, 1919.—Agronomic notes on this crop in Jamaica, compiled from a lecture by L. L. Carrington published in Jamaica Gleaner, February 27, 1919.—*C. V. Piper.*

1342. Anonymous. **Clidemia hirta—a noxious weed in Fiji.** Agric. News [Barbados] 18: 137. May 3, 1919.—This tropical American plant is reported in a letter from the Fiji government to the government of British Guiana as having become an agricultural pest in Fiji, where it is known as Kösters Curse. It is said not to be troublesome in the West Indies. —*C. V. Piper.*

1343. ANONYMOUS. **The grain sorghums.** Agric. News [Barbados] 18: 29. Jan. 25, 1919.—General historic and agronomic notes. Mazzagua guinea corn, a variety introduced in 1903 from Nigeria, is reported a fine cropper in the Leeward Island.—*C. V. Piper.*

1344. ANONYMOUS. [W. N. SANDS.] **The mahoe cockon tree in relation to cotton stainer control in St. Vincent.** Agric. News [Barbados] 18: 154–155. May 17, 1919.—See Bot. Absts. 3, Entry 932.

1345. ANONYMOUS. **Casuarina woods in Mauritius.** Agric. News [Barbados] 18: 51. Feb. 22, 1919.—See Bot. Absts. 3, Entry 930.

1346. ANONYMOUS. **Agricultural production.** Official Year Book, Union of South Africa 2: 432–445. 1919.—This is an account of the agricultural resources of the Union, the present production and possibilities of development. The following are dealt with in detail:—cultivation of cereals, fruit cultivation, viticulture, sugar industry, production of tea, cotton, and lucerne growing.—*E. M. Doidge.*

1347. ANONYMOUS. **Agricultural schools and experiment farms.** Official Year Book, Union of South Africa 2: 448–450. 1919.—See Bot. Absts. 3, Entry 1898.

1348. APPEL, O. **Die Pflanzkartoffel.** [The potato plant.] Landw. Hefte 36: *39 p.*, 7 *fig.* Paul Parey: Berlin, 1918.—Short treatise on the potato, its origin, varieties, diseases, improvement, propagation, storage, etc. Sixteen diseases are described and seven are illustrated.—*D. Reddick.*

1349. ATKINSON, ALFRED. **Farm pastures in Montana.** Montana Agric. Exp. Sta. Circ. 82: 61–68. 1919.—This paper presents a brief discussion of some methods of seeding and of seed mixtures recommended for pastures and summer feed under dry and irrigated farm conditions. For summer silage, corn and mammoth Russian sunflower are recommended.—*H. E. Morris.*

1350. BARBER, C. A. **Reminiscences of sugar cane work in India.** International Sugar Jour. 21: 390–395. 1919.—See Bot. Absts.

1351. BARTHE, A. E. **Organizacion moderna de los campos experimentales. III. Eliminacion de errores en los ensayos culturales.** [Elimination of experimental errors.] Revist. Agric. Com. y Trab. 2: 347–355. *Fig. 1–9.* 1919.—A discussion of the difference between demonstration and experimentation, the need of a national institute of agronomy in Cuba, methods of eliminating errors in field experiments through size and arrangement of plats, and the use of computing the probable error.—*F. M. Blodgett.*

1352. CALVINO, MARIO. **Una leguminosa gigantesca como yerba forrajera para Cuba. La "Mermelada de caballo" del Brasil. Meibomia leiocarpa.** [A Brazilian legume as a forage plant for Cuba.] Revist. Agric. Com. y Trab. 2: 308–316. *7 fig.* 1919.—Trials of this plant in Cuba indicate that it is a valuable forage plant for Cuba because of high yield and high food value. Other related plants are described and compared. Tests indicate that it may be of some use as a textile plant.—*F. M. Blodgett.*

1353. CARBALLO, ENRIQUE. **Instrucciones para los ensayos relativos al cultivo del ricino.** [Instructions for experiments relative to the cultivation of the castor bean.] Informacion Agric. [Madrid] 9: 55–57. *1 fig.* 1919.—A compilation covering the cultivation of the castor bean in Spain, including desirable soil types, temperature requirements, cultivation methods, and manner of harvesting.—*John A. Stevenson.*

1354. CLAASSEN, P. W. **A possible new source of food supply.** Sci. Monthly 9: 179–185. *4 fig.* 1919.—Probably when the Indians were teaching the white man the use of corn and the potato he did not like them. Other Indian foods received little or no attention.—Cat-tail

(*Typha*) rhizomes dried and pulverized were used by the Indians as a sweet flour for making bread and pudding; bruised and boiled fresh they made a syrupy gluten in which corn meal pudding was mixed. J. D. Hooker states that Typha pollen is made into bread by the natives of Scind and New Zealand.—This plant is found in large quantities in what is usually considered waste ground. The rhizomes form a network 3 to 4 inches under ground and measure ½ to 1 inch in diameter. The starch is found in almost a solid mass in the center of the rhizome. Based on a square-yard determination, the yield would approximate 5500 pounds of flour per acre.—A comparison of cat-tail flour with other flours shows a very similar composition. Puddings and biscuit were made with 33, 50 and 100 per cent cat-tail flour and the flavor was pleasing.—Questions of cultivation and practical methods of separating the flour need further investigation.—*L. Pace.*

1355. Cockayne, A. H. **Cocksfoot: Its establishment and maintenance in pasture.** New Zealand Jour. Agric. 18: 257–271. *Fig. 1–18.* 1919.—This grass (*Dactylis glomerata*) is one of the most important used in the formation of New Zealand pastures on account of its large yield, high degree of palatability, varied adaptations to soil and climate, and its great persistence. It is not used so much for short rotation pastures as for those of long duration. Cocksfoot has two great disadvantages (1) its tussocky growth-form and (2) almost complete stoppage of growth during the winter. On steep slopes it does not last long unless in mixture with turf forming grasses such as *Poa pratensis* and crested dogs-tail. When subjected to continuous grazing (the usual practice in New Zealand grassland) seed is rarely produced. Approximately 2000 tons of cocksfoot seed are sown annually in New Zealand. A good crop of seed of this species will average 150 to 200 pounds per acre.—*E. R. Hodson.*

1356. Cruz, José. **El abonado de la remolacha. [Fertilization of the sugar beet.]** Informacion Agric. [Madrid] 9: 171–173. 1919.—See. Bot. Absts. 3, Entry 1784.

1357. DeOng, E. R. **Effect of excessive sterilization measures on the germination of seeds.** Jour. Econ. Entomol. 12: 343–345. 1919.

1358. Dibble, W. **Seed-Potatoes: Experiment at Weraroa, regarding size, etc.** New Zealand Jour. Agric. 18: 297–298. 1919.—The objects were to find out the most profitable and economical size of cut or whole potato for seed purposes, and the best depth to plant the seed as a preventive against blight. It is concluded that cut seed-tubers deeply planted in well prepared and drained soil, give the best results.—*E. R. Hodson.*

1359. Dorlas, José Herrera. **Seleccion de semillas. [Seed selection.]** Bol. Assoc. Agric. España 11: 90–95. 1919.—The importance of seed selection to the agriculturists of Spain, based on search for and use of seed from plants found resistant to drought and poor soil (the unfavorable conditions most common) is emphasized.—*John A. Stevenson.*

1360. Findlay, Wm. M. **Red clover.** North Scotland Coll. Agric. Bull. 24. *39 p.* 1919. The failure to obtain a stand of red clover is attributed to three causes: (1) Poor or unadapted seed, (2) Unfavorable soil, (3) Competition of nurse crop or other plants in meadow or pasture mixture. English late-flowering (*Trifolium perenne*) and English broad-leafed (*T. pratense*) clovers from colder or more northerly regions are best adapted for northern Scotland. Too thick seeding of the nurse crop, and the use of rapidly growing grasses such as Italian rye-grass in the meadow or pasture mixture reduces the stand of clover. Lack of potash and lime, not phosphates, is the limiting fertilizer factor. Clover after potatoes was better than after turnips. The amount of soil moisture was less after late pulled turnips, and on unmanured soils.—*M. F. Abell.*

1361. Findlay, Wm. M. **The size of seed.** North Scotland Coll. Agric. Bull. 23. *15 p.* 1919. Large and small seed of various crops were compared under two heads: (1) Differences in yield due to different sized seeds in the same sample. (2) Differences in yield due to different sized seeds in different samples of the same variety. Results showed increases the first year in the first group, and variation in the latter group, the variation being ascribed to the greater influence on yield of strain and origin than of size of seed.—*M. F. Abell.*

1362. FRYER, J. R. **Germination of oats exposed to varying degrees of frost at different stages of maturity.** Agric. Gaz. Canada 6: 337-339. 1919.—Oat plots were sown in series at the Lacombe Experimental Station in order that when frosts should occur in the fall the different plots would be in various stages of maturity. The effect of frost, ranging from 2.3° to 8°F., on germination was studied, the maturity of the oat kernel ranging from the milk stage through various stages to the dry and mealy one. A frost of 2.3°F. did not impair vitality in stages ranging from milk to dough. A heavier frost of 4.6°, accompanied by a heavy dew, did not lower vitality in stages from milk to mealy. A frost of 5° followed by one of 8° the next night reduced vitality considerably in the milk and dough stages.—*O. W. Dynes.*

1363. GAVILAN, JUAN. **El problema de las textiles.** [**Problem of the textiles.**] Informacion Agric. [Madrid] 9: 49-51. *1 fig.* 1919.—The importance of textiles to the world and in particular of cotton is considered. Spain, unlike France and England, cannot draw on colonies for raw material for her textile factories. Experiments have shown that heavy yields of cotton can be obtained in Spain but present tariff protection is considered insufficient.—*John A. Stevenson.*

1364. GAVILAN, JUAN. **Nitrato de sosa de Chile.** [**Chilean nitrate.**] Informacion Agric. [Madrid] 9: 25-29. *5 fig.* 1919.—See Bot. Absts. 3, Entry 1708.

1365. GUZMANES, ANTONIO. **La ortiga.** [**The nettle.**] Informacion Agric. [Madrid] 9: 167-169. *2 fig.* 1919.—Two species (*Urtica divica* and *U. nivea* [*Boehmeria nivea*] the latter from China) are commonly grown in Europe for their fiber content. The former is a common weed in Spain. The industry has been revived because of war conditions in Denmark and other parts of Europe. The plant is cultivated and the fiber obtained much the same as with flax and hemp.—*John A. Stevenson.*

1366. HARRIS, WM. **Notes on sisal and henequen in Jamaica.** Jour. Jamaica Agric. Soc. 23: 46-50. 1919.—The cultivation of sisal (*Agave sisalana*) is considered, including manner of propagation, desirable types of soil, planting methods, care of the plantation, time and manner of harvesting, and finally the extraction, drying and baling of the fiber. A similar account is given for henequen (*Agave fourcroydes*), the common fiber plant of Yucatan.—*John A. Stevenson.*

1367. HAUTEFEUILLE, L. **Le sisal en Afrique.** [**Sisal in Africa.**] Jour. Agric. Tropic. 19: 260-263. 1919.—The production of *Agave rigida* var. *sisalana* in both East and West Africa is described.—*J. D. Luckett.*

1368. HERMAN, V. R. **Soybeans and cowpeas for North Carolina.** North Carolina Agric. Exp. Sta. Bull. 241. *40 p.* June, 1919.—This is a discussion of the following topics: cowpeas for hay, curing cowpea hay, cowpeas for seed, cowpeas for temporary pasture, cowpeas for soil improvement, cowpeas in rotation, cowpea culture, method of planting, fertilizers for cowpeas, inoculation, time to plant, diseases of cowpeas, insect enemies of cowpeas, variety tests, cowpea varieties, soybeans for hay, soybeans for seed, soybeans for pasture, soybeans for soil improvement, methods of culture, rate of seeding soybeans, fertilizer for soybeans, soybean culture experiment, soybean varieties, and cowpeas and soybeans compared.—*R. A. Jehle.*

1369. HILSON, G. R. **'Northerns' cotton.** Agric. Jour. India 14: 300-314. 1919.—In order to improve the "Northerns" cotton; more time and research must be given to improve the plant; and the following features need attention: better harvesting and preparation for the market, better ginning, establishment of an open market to which *kapas* (unginned cotton) might be brought, and the establishment of ginneries properly fitted and constructed and either owned or controlled by the buying firms.—*F. M. Schertz.*

1370. Holmes-Smith, E. **Fibre plant investigations.** South African Jour. Indust. 2: 157–172. 1919.—Generally speaking the whole of the coastal area from the Transkei to Mossel Bay offers great possibilities for the development of fiber growing and fiber industries. It is recommended that sisal hemp, Mauritius hemp and New Zealand hemp should be extended and encouraged as far as possible. The climatic and soil conditions of this part of the Cape Province appear more suited to the growing of "hard fiber" than of "soft fiber" plants. The writer suggests that experimental plantations upon a moderate scale be laid down in the vicinity of Kei Bridge (Transkei), East London, Kingwilliamstown, Port Elizabeth, Uitenhage or Humansdorp, Knysna or George.—*E. P. Phillips.*

1371. Jardine, James T., and Mark Anderson. **Range management on the national forests.** U. S. Dept. Agric. Bull. 790, *98 p. 32 pl.* 1919.—See Bot. Absts. 3, Entry 1444.

1372. Keller, G. N. **Tobacco growing in Ireland. The experiments in 1918.** Jour. Dept. Agric. Ireland 19: 298–302. 1919.—Discusses various phases of culture, pests and diseases, and use. *Donald Folsom.*

1373. Kiesselbach, T. A. **Forage crops.** Nebraska Agric. Exp. Sta. Bull. 169. *56 p. 8 fig.* 1918. A brief description of the principal forage crops suitable for various Nebraska conditions is given, and cultural practices are outlined. The results of comparative forage-crop tests at the Experiment Station during three years, 1914–17, are tabulated.—During three years alfalfa cut for hay earlier than the normal stage of maturity, resulting in five seasonal cuttings instead of three or four, reduced the three years average yield from 5.57 tons to 3.7 tons per acre. Such frequent cutting decidedly reduced the vigor and number of plants. The yield of alfalfa cut less than the normal number of times was reduced to 3.43 tons for two cuttings in contrast to 5.57 tons normal. After three years' cumulative effect of cutting-frequency, all the alfalfa was cut a fourth season at the normal stage of maturity with the following results: (1) previous normal cutting yielded 3.40 tons; (2) previous too-frequent cutting 2.16 tons; (3) previous insufficient cutting 3.11 tons.—*T. A. Kiesselbach.*

1374. Lee, S. C. **Electrical treatment of seed.** Agric. Gaz. Canada 6: 173–175. 1919.

1375. Long, Frances Louise. **The quantitative determination of photosynthetic activity in plants.** Physiol. Res. 2: 277–300. June, 1919. [Serial no. 16.]—Method for comparing net photosynthetic activity of different varieties under same conditions, or of same variety under different conditions. [See Bot. Absts. 3, Entries 2685, 2833; 4, Entry 241.]—*B. E. Livingston.*

1376. Lyon, T. L. **Experiments in fertilizing a crop rotation.** New York Agric. Exp. Sta. [Cornell] Bull. 399: 19–30. Feb., 1919.

1377. MacDermott, F. D. **Agricultural and pastoral South Africa.** South African Jour. Indust. 2: 419–435. 1919.

1378. MacDermott, F. D. **Agricultural and pastoral South Africa.** South African Jour. Indust. 2: 505–519. 1919.

1379. Main, F. [Rev. of: Fauchère, A. **Guide pratique d'agriculture tropicale.** *159 p.* Paris: Augustinn Challamel. 1918.] Jour. Agric. Tropic. 19: (Bull. Bibliog.): 127. 1919.—A treatise on the development of agriculture in French colonial possessions.—*J. D. Luckett.*

1380. Malte, M. O. **Sugar content and its relation to winter hardiness.** [Rev. of: Akerman, A., Hj. Johansson, and B. Platon. Fortsatta Undersökningar Rörande Sockerhalt och Torrsubstanshalt hos Några Höstvetesorter, Sveriges Utsadesforenings Tidskrift (Jour. Swedish Seed Assoc.) 28: 216–224. 1918.] Agric. Gaz. Canada 6: 329–331. 1919.—Four varieties of winter wheat with varying degrees of winter hardiness were grown together under uniform conditions and analyzed for their sugar contents at various times during the growing period. A direct correlation was found between winter hardiness and high sugar content or the amount of reducing substances in the plant cells.—*O. W. Dynes.*

1381. MATTHEWS, W. H. **The agricultural progress of the pomeroon between the years 1905-1917.** Jour. Bd. Agric. British Guiana 12: 6–10. 1919.

1382. MCCULLOCH, W. J. **Ensilage in Southland: Demonstration at Gore experimental area.** New Zealand Jour. Agric. 18: 284–287. *Fig. 1.* 1919.

1383. MELLE, H. A. **Kikuyu grass (Pennisetum longistylum Höchst.).** Agric. Jour. South Africa 9[44]: 29–33. *1 fig.* 1919.—Reprinted from Union of South Africa, Dept. Agric. Bull. Local Ser. 45: 1–7. 1918.

1384. METGE, G. [Rev. of: KRAUS, C. **Erfahrungen beim Anbau der Sonnenblume. Experiences in the culture of the sunflower.**) Deutsch. Landw. Presse 44: 455–466. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 256–258. 1918.—The amount of oil produced by the sunflower was found to be low when compared with that obtained from other crops, as rape and poppy. The author apparently does not advise cultivation of the sunflower for oil either in small plots or on a large scale, for the plot experimented on barely paid expenses. —*F. M. Schertz.*

1385. METGE, G. [Rev. of: CLAUSEN. **Die Bodenausnutzung durch die Kartoffel bei kleinen und grossen Saatknollen und bei enger und weiter Pflanzenzweite. (Utilization of the soil by the use of large and small seed potato tubers and by close and wide spacing.)** Illustr. Landw. Zeitg. 37: 108–109. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 285. 1918. —The author obtained 20,000 pounds more per hectare by using large potato tubers for seed than when he used small ones. Large tubers as seed are especially recommended for poor soil. Good results are secured if small seed potatoes are spaced close together in the rows while large ones are spaced farther apart (2 ft.).—*F. M. Schertz.*

1386. METGE, G. [Rev. of: WAGNER, P. **Wie wirkt die Saatgutbeschaffenheit auf den Kartoffelertrag unter dem Einfluss verschiedener Pflanzweite, Düngung und Jahreswitterung. Influence of the seed stock on the yield of potatoes under the influence of different distances of planting, manuring and weather.**) Deutsch. Landw. Presse 45: 169, 175–176, 183. 1918.] Biedermann's Zentralbl. Agrikulturchem. 47: 325–333. 1918.—The author conducted field experiments on sandy soil and on loam. His results from loam soil are as follows: Whole potatoes of 50 grams weight under unfavorable weather and bad nutrient relations gave less yield than whole potatoes of 75 grams weight. Stronger fertilizing or better weather was able, to a large extent, to make the difference in yield not so great. Under the favorable conditions of the year 1917 the small (50 grams) and the cut potatoes (60 grams) yielded from 12 to 18 per cent less than the larger whole potatoes (75 grams). Experiments on sandy soil were conducted according to the following scheme: (1) Small potatoes of 50 grams weight. (2) Large potatoes of 70 grams weight. (3) Half potatoes of 60 grams weight. (4) Alternately a large and a small potato. (5) Alternately a large, a small and a half potato. The tubers were planted according to three schemes as to spacing. (1) 60 by 49.0 cm. apart. (2) 60 by 55.5 cm. apart. (3) 60 by 59.5 cm. apart. Three different mixtures of fertilizers were used. (7) Potassium phosphate without nitrogen. (2) Potassium phosphate with 46.5 grams of nitrogen as ammonia. (3) Same as 2, only using 77.5 grams of nitrogen as ammonia. Conclusions are: (1) The half potatoes gave a considerably inferior yield than the whole potatoes. (2) The increased nitrogen fertilizer gave an increase in the potato yield. (3) 50-gram potatoes gave a yield slightly superior to 70-gram potatoes. (4) The greater yield was obtained when large and small potatoes were planted alternately. The smallest yield was obtained when the potatoes were cut. Spacing the plants 60 by 49.0 cm. gave a yield of 502 hundredweight per hectare, 60 by 55.5 cm. yielded 512 hundredweight, and 60 by 59.5 cm. yielded 520 hundredweight. Hence the wider spacings were progressively more productive—*F. M. Schertz.*

1387. MEUNISSIER, A. **Le tabac en Indo-Chine et à Maurice.** [Tobacco in Indo-China and Mauritius.] Jour. Agric. Tropic. 19: 263–265. 1919.—A brief description of the industry —*J. D. Luckett.*

1388. Mottet, S. **Pommes de terre de grande consommation.** [Principally used potatoes.] Revue Horticole 91: 232–234. *1 pl. (colored).* Feb., 1919.—A critically descriptive list of several mid-season and late varieties of potatoes. The author states that he has previously published two other articles on the same subject.—*E. J. Kraus.*

1389. Mullet, H. A. **Lolium subulatum, Vis., "Wimmera" rye-grass.** Jour. Dept. Agric. Victoria 17: 266–278. *Fig. 6.* 1919.—A hardy species of rye-grass hitherto unrecorded in Victoria, and of great promise for sowing of pastures in the wheat belt. The root system is fibrous and extremely vigorous. The seed is larger and plumper than average samples of rye-grass, and is capable of retaining its vitality for several years. Propagation is by seed only. The stems possess the usual purplish base characteristic of rye grass. The grass does better on the red clays than on friable black soils. It is stated that *Lolium subulatum* will double the stock carrying capacity of the present Mallee pastures.—*J. J. Skinner.*

1390. Müller, B. [Rev. of: Ranninger, Rudolf. **Die Kultur des Mohnes.** [Culture of poppies.] Nachr. Deutsch. Landw. Ges. Österreich 1917[9]: 89. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 254–256. 1918.—Poppies were planted in rows respectively 60, 50, 40, 30, 20, and 10 cm. wide while the plants in the rows were respectively 50, 40, 30, 20, 10, and 5 cm. apart. Rows 30 cm. wide and plants 20 cm. apart in the rows gave very favorable results, for most of the plants produced 3 to 4 capsules. Descriptions are given of the care of the plants and the collection of the capsules. The yield averaged about 1700 pounds per hectare. The weight of a hectoliter varied from 56 to 63 kg.—*F. M. Schertz.*

1391. Müller, B. [Rev. of: Koritschoner, Fr. **Die Quecke als Malzersatz in der Brauindustrie.** (Couch grass in brewing.) Chemiker Zeitg. 41: 797–798. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 277–279. 1918.—In Germany it was proposed to use the rhizome of couch grass (*Triticum repens L.*) in the brewing industry, because of the scarcity of malt. The dried rhizome yields 20 per cent of extract which is derived chiefly from the reserve carbohydrate triticin, which forms levulose on hydrolysis. Difficulties in manufacture were great and the beers thus brewed were undrinkable after storage.—*F. M. Schertz.*

1392. Nobbs, Eric A. **Maize grading in southern Rhodesia.** Rhodesia Agric. Jour. 16: 5–17. 1919.

1393. Pando y Armand, Luis de. **El cultivo del ricino en secano y sin abonas.** [Cultivation of the castor bean in dry lands without fertilizers.] Bol. Assoc. Agric. España 11: 96–99. 1919. Satisfactory yields were obtained with *Ricinus sanguineus* in an area of scanty rainfall (province of Alicante, Spain) without the use of fertilizers. Methods of planting, cultivation, and harvesting are given. *John A. Stevenson.*

1394. Pole Evans, I. B., and K. Lansdell. **The weeds of South Africa. IV. The Imbricate Cactus (Opuntia imbricata Haw. Family, Cactaceae.)** Union South Africa, Dept. Agric. Bull. Local Ser. 76. 1919.

1395. Pole Evans, I. B., and K. Lansdell. **The weeds of South Africa. VI. The khaki-weed, Alternanthera Achyrantha R. Br. (Family, Amarantaceae).** Union South Africa. Dept. Agric. Bull. Local Ser. 73. *1 p.* 1919.—Popular.

1396. Pole Evans, I. B., and K. Lansdell. **The weeds of South Africa. VII. The cockle-bur or kanker-roos, Xanthium occidentale L. (Family, Compositae).** Union South Africa Dept. Agric. Bull. Local Ser. 74. *1 p.* 1919.—Popular.

1397. Pole Evans, I. B., and K. Lansdell. **The weeds of South Africa. VIII. The jointed cactus, Opuntia aurantica Gilles. (Family Cactaceae).** Union South Africa, Dept. Agric. Bull. Local Ser. 75. *1 p.* 1919.—Popular.

1398. RICHTER. [Rev. of: FALLADA, O. **Zur Rübensamenbeizung mit Schwefelsäure. (Germination of beet seed after corrosion with sulphuric acid.)** Oesterreich-Ungar. Zeitschr. Zuckerindust. und Landw. 22: 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 324–325. 1918.

1399. RITZEMA BOS, J. **Boekbespreking.** [Book review.] [Rev. of: HEIDEMA, J. **Bestrijding van Onkruiden. (Combatting weeds.)** *3 ed., price 55 florins.* J. B. Walters: Groningen and The Hague.] Tijdschr. Plantenz. 24: 220. 1918.

1400. ROBBINS, W. W., AND BREEZE BOYACK. **The identification and control of Colorado weeds.** Colorado Agric. Exp. Sta. Bull. 251. *123 p., 77 fig.* 1919.—This bulletin discusses the legal aspect of weed control, pure seed, losses caused by weeds, nature of weeds, principles of weed control, weeds as ensilage. Descriptions and illustrations of the principal Colorado weeds constitute the larger part of the bulletin.—*Walter G. Sackett.*

1401. SAMPSON, ARTHUR W. **Plant succession in relation to range management.** U. S. Dept. Agric. Bull. 791. *76p., 26 fig.* 1919.—See Bot. Absts. 4, Entry 380.

1402. SCHATZLEIN. [Rev. of: SIDENIUS, E. **Düngungsversuche zu Tabak 1915 bis 1916. Fertilizer experiments on tobacco, 1915–1916.)** Mededeel. Proefstat. Vorstenlandsche Tabak 26: 1916.] Biedermann's Zentralbl. Agrikulturchem. 47: 318–320. 1918.—See Bot. Absts. 3, Entry 1790.

1403. SCHERFFIUS, W. H. **Notes to cotton growers.** Agric. Jour. South Africa 9[1]: 35–37, *4 fig.* 1919.

1404. SCHRIBAUX, F. **Sobre las siembras tardias de remolachas.** [Concerning late sowing of sugar beets.] Informacion Agric. [Madrid] 9: 198–199. 1919.—As a means of overcoming delay in sowing, due to scarcity of labor, soaking the seeds for from two to five days in advance of planting is recommended. The seeds are dried either in the sun or artificially and are planted immediately, although there is no injury if sowing is delayed a day or so.—*John A. Stevenson.*

1405. SHAW-SCOTT, G. **Prospects of hop-growing in South Africa.** South African Jour. Indust. 2: 519–533. 1919.

1406. SOUTHWORTH, W. **Development of fodder corn.** Agric. Gaz. Canada 6: 258–261. *Fig. 1–2.* 1919.—Several years test for yield of a number of northern grown varieties of corn (maize) is presented.—*O. W. Dynes.*

1407. SPAFFORD, R. R. **Farm types in Nebraska as determined by climatic, soil and economic factors.** Nebraska Agric. Exp. Sta. Res. Bull. 15. *37 fig.* 1919.—Nebraska agricultural areas as determined by climate, soil and economic factors, are chiefly considered. The data are mostly taken from the Thirteenth Census of the United States. The paper deals mainly with the kinds of crops grown and their yields.—It is concluded that temperature has the greatest effect in determining the boundaries of crop types, but that rainfall, soil and economic conditions can have a marked influence.—*T. A. Kiesselbach.*

1408. TAYLOR, H. W. **Cotton culture.** Rhodesia Agric. Jour. 16: 197–201. 1919.

1409. TAYLOR, H. W. **Tobacco cultivation. The importance of selecting seed plants and grading seed.** Rhodesia Agric. Jour. 16: 18–23. 1919.

1410. THOMAS, ROGER. **The improvement of "Tinnevellies" cotton.** Agric. Jour. India 14: 315–330. 1919.—The paper deals with the work done, up to the end of the 1917 season, on the selection, propagation and marketing of unit strain selections of cotton in the 'Tinny' tract) three southernmost districts of the Madras Presidency. An attempt is being made to

eradicate from the "Tinny" tract a low-grade cotton (a variety of *Gossypium neglectum*) locally known as '*pulichai*.' Drill cultivation is being introduced and drill sowing and interculturing implements are being manufactured.—*F. M. Schertz.*

1411. Tuero, F. **Cultivo del agave americano ó pita.** [Cultivation of the American agave.] Informacion Agric. [Madrid] 9: 32–37 *1 fig.* 1919.—A compilation dealing with the desirable climate and soils for growing the agave in Spain, methods of planting, cultivation, harvesting, extracting and packing the fiber, and the expenses and profits of the undertaking. Brief notes on the uses of various parts of the plant are included.—*John A. Stevenson.*

1412. Volhard, J. [Rev. of: Heinrich, M. **Versuche zur Verbesserung dumpfigen Getreides.** (Investigation for the improvement of musty grain.) Versuchsstat. 90: 49–67. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 273–76. 1918.—A powder evidently containing calcium or magnesium oxide mixed with a bicarbonate was recommended for the treatment of musty grain. The author states that the powder did not cause any great lowering of the moisture content of either dry or moist oats.—*F. M. Schertz.*

1413. Walters, J. A. T. **Improvement of the veld by artificial means.** Rhodesia Agric. Jour. 16: 32–36. 1919.—The four characteristics which distinguish the Rhodesian veld and restrict its stock-carrying capacity are: (1) The prevalence of sour grasses (i.e. grasses that are fibrous in texture, wiry to the touch and not unfrequently with an objectionable odor. (2) The scarcity of edible legumes. (3) The early-maturing nature of the grasses. (4) The occurrence of a long winter drought. The lack of succulence in winter can be overcome by planting Napier fodder and other similar plants and by providing ensilage; the absence of legumes can be obviated by the growing of various perennials. A permanent hay crop is provided by molasses grass and it is more than probable that Kikuyu grass from British East Africa will prove the basis of a short pasturage which will be of great value for both sheep and cattle.—*E. M. Doidge.*

1414. Weingart, W. **Kleine Mitteilungen.** [Minor contributions.] Monatsschr. Kak teenk. 29: 10. 1919.—See Bot. Absts. 3, Entries 3028, 3029.

1415. Williams, C. B. **Report of the division of agronomy.** North Carolina Agric. Exp. Sta. Ann. Rept. 41: 22–35. [1919.]—This is a brief report of work on mapping and analyzing soils, soil fertility experiments, cotton breeding investigations, crop improvement, tests with varieties of field crops, and miscellaneous tests with tobacco.—*R. A. Jehle.*

1416. Wood, R. Cecil. **Some agricultural aspects of the Hosur Remount Depot.** Agric. Jour. India 14: 201–205. 1919. For the remount depot the author recommends the growing of mixed fodder crops.—*F. M. Schertz.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

1417. Peirce, George J. **What kinds of botany does the world need now?** Science 49: 81–84. Jan., 1919.—In this address (delivered at the meeting of the San Francisco Bay Section, Western Society of Naturalists) the author calls attention to the fact that, with the termination of the war, the obligation falls upon scientific men to review their sciences, and to consider the relations of science to human life, human needs and human ideals. The world has little idea of what botany really is or what its devotees are trying to accomplish. The various branches of botanical science—forestry, bacteriology, horticulture, agriculture—have, themselves, forgotten their origin, and men engaged in these fields have ceased to realize that they are applying what has been learned by investigations of the few. Pure science should not be neglected merely because the world is hungry, but because the world is hungry botanists may be able to make an estimate of what parts of the field of study are likely to help

most to relieve present needs. The world possibly may not have been so hungry today if botanists had reflected more upon the processes of nutrition in plants. Food can be made, and made so near points of maximum consumption, that problems of transportation can be greatly reduced, if the kinds of food and methods of culture are more accurately adjusted to the demand.—*A. H. Chivers.*

1418. POOL, RAYMOND J. **About high-school and college botany.** School Sci. Math. 19: 497-500. June, 1919.—Botany, the "sick man" of the high-school curriculum, is on the very edge of dissolution. We have a far greater field for teaching the science of plants if we take time freely to those phases of world life and society dependent upon plants than if we confine it to the *Pleurococcus-Taraxacum* gamut and to the gametophyte-sporophyte intricacies of the plant phyla. High schools should shelve some of their microscopes and get down to the living, growing, producing plant and its vital relation to this storm-tossed world. We have got to do this or others will do it for us. Suggested course: (1) The leaf: anatomy, growth, water-loss, photosynthesis, uses. (2) Roots: structure, physiology, development. (3) Stem: wood, fibers, pruning, grafting. (4) Flower: forms, sex-organs, commercial value. (5) Seed and fruit: kinds, food content, production, dissemination. (6) Ecology: plant communities and distribution. (7) Main groups of plants, evolution. (8) Plant-diseases: causes, symptoms, control. (9) Weeds: damage, kinds, dissemination, eradication. (10) Flowering plants: principles of classification, important economic groups and species.—*A. Gundersen.*

FOREST BOTANY AND FORESTRY

RAPHAEL ZON, *Editor*

1419. ANONYMOUS. **Forest investigation.** Amer. Forestry 25: 1218–1219. 1919.—There has been a growing conviction on the part of foresters in the United States that the amount of silvical research conducted by all agencies, including the Federal Government, is very inadequate. Problems exist in the southern pine region, the hardwood region in the Appalachians and neighboring States, the Lake States, New England and the West.—*Chas. H. Otis.*

1420. ANONYMOUS. **Forests.** Official Year Book, Union South Africa 2: 451–458. 1919.—This is a general survey of the nature and extent of the timber forests of the Union, the policy of the Government with regard to the forests and the production and importation of timber. A list is given of indigenous trees reserved under the Forest Act, No. 16 of 1913.—*E. M. Doidge.*

1421. ANONYMOUS. **A national forest policy—why and how.** Amer. Forestry 25: 1049–1052. 1919.—An article made up largely of quotations from speeches by Henry S. Graves, Forester, United States Forest Service, incorporating lumbering statistics of importance and his ideas of a future forest policy.—*Chas. H. Otis.*

1422. ANONYMOUS. **Report on the Botanical and Forestry Department for the year 1917.** [Hong Kong, China.] *18 p.* [Received in U. S. August, 1918.]—A collection of short notes dealing with the administration of this department and primarily of local interest. The notes deal with activities in connection with the Botanical Gardens and various grounds and nurseries in charge of the superintendent. The forestry activities include the formation of pine and broad-leaved tree plantations; the care of such plantations; the protection of forests from fire and insect damages; the planting and care of roadside trees; the making and repairing of roads and paths; and other activities of less importance. Appended to the report are seven tables and a supplement. The tables deal with the rainfall of the current year; a classification of the offences committed against the forestry laws; the results of bringing these cases before the police courts; a list of flowering trees and shrubs planted; and various matters dealing with expenditures and revenues. The supplement enumerates 15 species of

plants added during the year to the flora of Hong Kong and adjacent territory.—The report discloses that the total rainfall at the Botanical Gardens for the year was 85.51 inches of which almost 33 inches fell in July. Typhoon signals were hoisted four times and considerable damage was done by these storms to the vegetation. Species of *Melaleuca, Casuarina, Eucalyptus, Tristania, Aleurites,* and *Celtis* were planted for forestry purposes. The clearing of undergrowth at Government expense for anti-malarial purposes amounted to over 5,000,000 square feet. The revenue amounts to only 14 per cent of the annual expenditures in this department.—*Richard H. D. Boerker.*

1423. Anonymous. **The rubber industry of the future.** Tropical Life **13**: 41–42. 1919.—Chiefly comment regarding a paper on "The rubber industry—past and present" presented by B. D. Porritt (Chief Chemist to the North British Rubber Company, Ltd., of Edinburgh) before the Royal Society of Arts. Of interest is a tabulation by countries of the consumption of raw rubber in 1917. The United States consumed 69 per cent of the total against 10.2 per cent by Great Britain.—*H. N. Vinall.*

1424. Anonymous. **Transplanting large trees.** Amer. Forestry **25**: 1198. 1919.—In transplanting mature trees the chances of success are best with elm; but maple, horse chestnut, catalpa, ash, linden, willow, poplar and pin oak can be transplanted with more or less success if the proper methods are employed.—*Chas. H. Otis.*

1425. Babbitt, W. H. **Uncle Sam, lumberman, Canal Zone.** Amer. Forestry **25**: 1265–1267. *6 fig.* 1919.—A description of the saw-mill and lumber business operated by the United States Government on the Panama Canal Zone, with notes on the characteristics of the trees of the region, especially espavay, lignum-vitae, nispero or bullet-tree and almendra.—*Chas. H. Otis.*

1426. Beeson, C. F. C. **The food plants of Indian forest insects. Part II.** Indian Forester **45**: 139–153. 1919.—A continuation of work previously noted.—*E. N. Munns.*

1427. Brown, Nelson Courtlandt. **Forestry and the war in Italy.** Jour. Forestry **17**: 408–412. 1919.—The forest resource of Italy suffered heavily during the war because of the lack of imports, increased demands from industry, the lack of a coal supply, and destruction in battle. The future supply will have to come largely from plantations to the extent of some 30 per cent of the area of the country.—*E. N. Munns.*

1428. Chandler, B. A. **Results of cutting at Ne-ha-sa-ne Park in the Adirondacks.** Jour. Forestry **17**: 378–385. *Fig. 1–3.* 1919.—The working plan for the mixed conifer and hardwood forest in 1898 failed to give the results looked for, as hardwoods took advantage of the spruce which is competing with other plants throughout its life. Hardwoods seeded down better, grew more readily, and responded to environmental changes more rapidly than did spruce. Apparently management for spruce demands intensive methods, cutting hardwoods as closely as possible and freeing spruce unless badly suppressed. The diameter limit of cutting is a failure, and favors hardwoods. The best method is probably clear-cutting and planting.—*E. N. Munns.*

1429. Clapp, Earle H. **Forest research and the war.** Jour. Forestry **17**: 260–272. 1919.—During the war period the activities of the research branch of the U. S. Forest Service were spread to include practically every use of wood in modern warfare in addition to non-military uses. Savings to the government in the two years of war more than paid for all the money which has been expended without attempting to measure the indirect benefits. The great need for further investigations is emphasized.—*E. N. Munns.*

1430. Cremata, Merlino. **Cercas, alambradas y setos en Cuba.** [**Fences and hedges in Cuba.**] Revist. Agric. Com. y Trab. **2**: 330–334. 1919.—See Bot. Absts. 3, Entry 2254.

1431. CROZIER, R. H. **The cultivation of eucalypt trees.** South African Jour. Indust. 2: 234–238. 1919.—Of the numerous species of *Eucalyptus*, many produce timber of exceptional value, often unequalled for special purposes by any other timber in the world. They can be utilized to advantage where lightness is not an essential and where their hardness is not a serious drawback. The following species possess qualities of strength, durability, or rapidity of growth which warrant their extensive cultivation: *Eucalyptus cornuta, E. gomphocephala, E. redunca, E. siderozylon, E. paniculata, E. staigeriana, E. hemiphloia, E. rostrata, E. resinifera. E. muelleriana, E. botryoides* and *E. delagatensis.*—*E. P. Phillips.*

1432. CROZIER, R. H. **The properties and characteristics of some eucalypt trees and their suitability for cultivation.** South African Jour. Indust. 2: 62–73. 1919.—*Eucalyptus marginata* (Jarrah) yields an exceedingly durable timber; it is largely used for piles in sea water and in damp ground, and is in demand for railway sleepers, street blocks, etc. The timber from *E. diversicolor* (Karri) is used for shafts, spokes, felloes, etc. The green-colored timber from *E. gomphocephala* (Tuart) seasons fairly rapidly and shrinks remarkably little during the process; it is hard, tough and dense, and is used for framework of railway wagons, skips, beams, etc. The timbers of *E. redunca* (Wandoo), *E. lozophleba* (York gum), *E. salmonophloia* (Salmon Gum), *E. longicornis* (Morrell) season slowly and shrink to a comparatively small extent. *E. patens, E. calophylla, E. cornuta, E. paniculata, E. crebra, E. microphloia, E. siderozylon, E. staigeriana, E. microcorys, E. pilularis, E. maculata, E. saligna, E. propinqua, E. hemiphloia, E. longifolia, E. hemilampra, E. regnans, E. delegatensis* and *E. corymbosa* are mentioned; the characteristics of their wood and the nature of the soil in which they grow are detailed.—*E. P. Phillips.*

1433. DEMORLAINE, J. **Strategic importance of forests in the war.** Amer. Forestry 25: 1040–1043. *5 fig.* 1919.—Translation by SAMUEL T. DANA from Rev. Eaux et Forets [Paris] Feb., 1919. Revised to date by PERCIVAL S. RIDSDALE.—*Chas. H. Otis.*

1434. FROMBLING, C. **Achtet der niederen Pflanzenwelt. [Observe the lower plant forms.]** Zeitschr. Forst.- u. Jagdw. 51: 33–37. 1919.—A short but highly instructive treatise on the importance of the lower plant forms as indicators of site quality and reforestation possibilities.—*Hermann Krauch.*

1435. GASKILL, A. **Control of growing forests.** Amer. Forestry 25: 1284. 1919.—(A contribution to the general topic "A national forest policy.") A policy to be truly national must have in mind the necessities of the nation as a whole, yet recognizing that the greater part of the forest lands in this country are in private possession and under State, not Federal, control. Before growing (not mature) timber can be considered a safe investment for private owners, three things must be established; first, the fitness of a given area for continued use through one rotation at least) as forest; second, security against destruction; and third, assurance of the total, or ultimate, tax levy.—*Chas. H. Otis.*

1436. GRAVES, HENRY S. **A national lumber and forest policy.** Jour. Forestry 17: 351–363. 1919.—Halfway measures in handling the forest resource have failed, and will doubtless always fail, because of inherent weaknesses. Coöperation on the part of all agencies whose background is based on the lumber and forest resource is necessary to work out the adjustment of international relations, tax reforms, financial aids to the industry, while a policy of forest development making for permanency of operation, improvement in labor conditions, proper and regulated marketing, to encourage proper use of land is badly needed and of great importance to the public as a whole.—*E. N. Munns.*

1437. GRAVES, H. S. **The proposed legislation.** Amer. Forestry 25: 1281–1282. 1919.—(A contribution to the general topic "A national forest policy.") Any comprehensive program of forestry must involve the practice of forestry on privately owned timberlands. It is believed that success can be attained only through some plan of coöperation between the States and the Federal Government, with the States the active agents for carrying the plan

into effect and with the Federal Government stimulating action and aiding the States. Certain principles which should form the foundation of such a system are detailed.—*Chas. H. Otis.*

1438. HALL, WILLIAM L. **Influence of the National forests in the southern Appalachians.** Jour. Forestry 17: 402-407. 1919. The establishments of national forests has aided in the industrial and social transition of the southern Appalachian region, the influence showing in the change in the local population, in improvements of industries, and in forest management.—*E. N. Munns.*

1439. HAWLEY, R. C. **Measuring cordwood in short lengths.** Jour. Forestry 17: 312-317. 1919.—Irregularities exist in the measurement of cordwood where long lengths are cut into short lengths, due to practices in wood yards and with the character of the wood. In southern Connecticut, the amount of actual wood in a cord is between 95 and 100 cubic feet for 12-inch wood, and between 100 and 110 cubic feet for 20-inch wood.—*E. N. Munns.*

1440. HESSELMAN, HENRIK. **Iakttagelser över skogsträdspollens spridningsförmåga.** [**Dissemination of pollen from forest trees.**] Meddel. Statens Skogsförsöksanst. 16: 27-60. *Fig. 1-3.* 1919.

1441. HOLE, R. S. **The regeneration of sal (Shorea robusta) forests.** Indian Forester 45: 119-132. 1919.—A combination of the group and strip systems is indicated as the best method of securing natural regeneration of sal (*Shorea robusta*), by which the cutting-cycle will be reduced 35 years. Permanent strips three-fourths the height at maturity are laid out north and south, alternate strips to be cut off in rotation, the second strip after the reproduction has attained its height growth. The cutting is done in small patches during intervals of 5 years to permit regeneration to occur and keep weeds down. A modification later may prove necessary in working progressively by strips instead of alternating.—*E. N. Munns.*

1442. HOWE, C. D. **Some reflections upon Canadian forestry problems.** Jour. Forestry 17: 200-206. 1919.—Much of the forestry practice in Europe is based on the rule of thumb rather than on the understanding of definite biological principles, and in America we are falling into the habit of jumping to conclusions without sufficient evidence. Substantial data, both intensive and extensive, are necessary to determine practices and to remedy unsatisfactory conditions.—*E. N. Munns.*

1443. ILLICK, J. S. **Preliminary report of some forest experiments in Pennsylvania.** Jour. Forestry 17: 297-311. 1919.—Plantations have been made of a number of tree species and of these the native pitch pine (*P. rigida*) has done the best and, from stem analyses, the tree is an exceedingly rapid grower. Plantations of white pine on cut-over chestnut lands in this region show that they will not make satisfactory stands unless sprout growth is removed, and unless the competing cover is removed under 10 years it is suppressed beyond recovery. Assistance cuttings given to young plantations are of decided benefit, though the cuttings may be only a lopping off of the interfering branches. Three conversion experiments are described somewhat in detail giving data showing the effect of the cover and the cuttings on plantations.—*E. N. Munns.*

1444. JARDINE, JAMES T., AND MARK ANDERSON. **Range management on the national forests.** U. S. Dept. Agric. Bull. 790. *98 p., 52 pl.* 1919.—Discussion of the interrelations of grazing practice, range maintenance and game protection on the national forests. The relative adaptation of cattle, sheep, goats, and horses to various types of mountain and plain ranges is outlined, such factors as character of forage, topography, distribution of watering places, animal pests, etc., being influential. Recommendations are made for the maximum productivity of forage and the maintenance of ranges. Separate chapters are devoted to the management of cattle and sheep on ranges with especial reference to acreage quota, watering places, type of forage and salting. Other chapters discuss the reseeding of ranges, pro-

tection of watersheds, timber and game. Chronologically arranged references to related work of the Department are appended after each phase of the subject discussed.—*E. V. Hardenburg.*

1445. KELLOGG, R. S. **A discussion of methods.** Amer. Forestry 25: 1282–1283. 1919. —(A contribution to the general topic "A national forest policy.") The writer believes that it is neither practical nor expedient to compel the practice of forestry upon private lands through the interstate commerce provisions of the Constitution. Several suggestions bearing on the subject of a national forest policy are made.—*Chas. H. Otis.*

1446. KIENITZ, M. **Vorschläge für die Harznutzung 1919 auf Grund der Beobachtungen und Versuche in Chorin. [Suggestions for the conduct of naval stores industry in 1919, based on observation and experiments in Chorin.]** Zeitschr. Forst- u. Jagdw. 51: 6–32. 1919.—The war has stimulated the naval stores industry in Germany where formerly the greater portion of products were imported. Consequently it became necessary to exploit the pine forests of that country for stores, and experiments were started to determine the best methods of turpentining consistent with least injury to the trees but at the same time securing a maximum flow. These experiments are fully discussed and some results are stated, especially in regard to the effects of different methods of scarring on the flow of pitch.—*Hermann Krauch.*

1447. KIRKLAND, BURT P. **Organization of finance in forest industry.** Jour. Forestry 17: 236–244. 1919.—Much of the lumber industry is financed by borrowed capital at high interest rates. A reduction in the interest rate would save annually more than enough to secure a forest stand on all commercial cuttings and protect forests from fire, the present high interest rate being due to the speculative reputation of the industry, the high cost of loans and small borrowers. A Federal Forest Loan Board similar to the farm-loan institution would enable the industry to become better organized. The organization, functions, rates and loan restrictions of such a board are discussed in detail.—*E. N. Munns.*

1448. KITTS, J. A. **Forest destruction prevented by control of surface fires.** Amer. Forestry 25: 1264, 1306. 1919.—Forest fires are of three types—surface fires which spread over the surface of the forest floor, fed by the litter; ground fires which smolder in the ground, consuming the humus and sometimes the roots of trees; and crown fires which destroy the entire forest cover. A method of prevention of crown fires, practiced during 28 years by the writer in California, is suggested as a solution of the fire problem in the coniferous forests. The method consists in the burning of the forest litter by surface fire control, during and at the end of the wet season, burning over by rotation one-fiftieth to one-fifth of the forest area each year, the periodical rotation depending upon the local rate of litter accumulation. Eleven rules for surface fire control are detailed.—*Chas. H. Otis.*

1449. LANE-POOLE, C. E. **The kiln drying of jarrah.** Western Australia Woods and Forests Dept. Bull. 1. *28 p., 12 fig., 1 chart.* 1919.—This paper gives a short description of the process employed in kiln-drying jarrah (*Eucalyptus marginata*) on scientific principles. In choosing a kiln with which to experiment the author was led to select the kiln invented by Tiemann because of the latter's success in drying California blue gum (*Eucalyptus globulus*), a very difficult lumber to season. The construction and operation of the Tiemann kiln is described. A psychrometric chart designed to give the relative humidity for any temperature at a given dew point, is appended. In the experimental runs the kiln gave very encouraging results. The author suggests that it may be possible to shorten the period of drying by inserting a fan or blower between the baffles and the radiators with a view to increasing the air circulation.—*C. F. Korstian.*

1450. LANE-POOLE, C. E. **Report of the Woods and Forests Department for the half-year ended 30th of June, 1918.** Semi-Ann. Progress Rept. Woods and Forests Dept. Western Australia. *17 p.* 1919.—The work of the Department for the period considered is briefly summarized under the following captions: "Classification of forests, Reservations, Forest work,

Legislation, Forest ranging and timber inspecting, Plantation and nursery work, Forest apprentices, the Timber industry, Firewood permits, Shipbuilding, Revenue and expenditure, Botanical, Tanbarks, Sandalwood and sandalwood oil." In the jarrah country in the Southwest Division, the area of virgin forest was found to be exceedingly small. During the war the timber industry was very much depressed due to the shortage of ships. The report is appended by detailed tabulations of revenue and expenditure, timber and timber industry statistics, a list of herbarium specimens collected and identified and a list of trees planted at the Hamel State Nursery during the 6-month period.—*C. F. Korstian.*

1451. LEAVITT, CLYDE. **Some aspects of silvical research as an after-the-war activity.** Jour. Forestry 17: 273–280. 1919.—A plea is made for greatly increased silvical investigative work in the East, as the U. S. A. Government has established forest experiment stations in the West and none in the East. This work is not possible at present but needs federal aid to the states, so that educational centers and state foresters may be able to do intensive work.—*E. N. Munns.*

1452. LONG, FRANCES LOUISE. **The quantitative determination of photosynthetic activity in plants.** Physiol. Res. 2: 277–300. June, 1919.—Method for comparing net photosynthetic activity of different varieties under same conditions, or of same variety under different conditions. [See Bot. Abstr. 3, Entries 2685, 2833; 4, Entry 246.]—*B. E. Livingston.*

1453. LOVEJOY, P. S. **Review of lumber industry affairs.** Jour. Forestry 17: 245–259. 1919.—Articles appearing in the lumber trade journals during the last half of 1918 are made the subject of a discussion on the trend of thought regarding conditions in the lumber industry. Such topics as the government and the industry, export, census, accounting, and profiteering, are included.—*E. N. Munns.*

1454. MACCAUGHEY, VAUGHAN. **The mangrove.** Amer. Bot. 25: 42. 1919.

1455. MARTIN, DR. H. **Die Erhaltung der Buche in Sachsen, inbesondere in gemischten Beständen.** [Conservation of beech forests in Saxony, with especial reference to mixed stands.] Tharandter Forst. Jahrb. 70: 1–32. 1919.—The advantages of mixed stands are discussed in detail with reference to the relatively high rôle which beech plays in the improvement of the physical factors of site and quality of stand. A plea is made to encourage the conservation of beech forests and the growing of this tree in mixed stands is especially advised. In the current number of the above mentioned periodical the regeneration of beech in pure stands is discussed in accordance with the results of different methods of cutting. Consideration of the regeneration of mixed stands follows in the next number of the journal.—*Hermann Krauch.*

1456. MATTHEWS, D. W. **Tropical reconnaissance with special reference to work in the Philippines and British North Borneo.** Jour. Forestry 17: 371–377. 1919.—Tropical countries have not usually considered their forests as a whole, but have estimated only the amount of timber of certain special use and value. It is estimated that the stand in Borneo averages 1803 cubic feet per acre and in the Philippines 2389 cubic feet. How much the tropics will yield is problematical, though this should be able to tide over the timber supply until the temperate regions become more self-sustaining.—*E. N. Munns.*

1457. MAXWELL, HU. **The uses of wood. Wood used in the cooperage industry.** Amer. Forestry 25: 1208–1216. *19 fig.* 1919.—Two kinds of cooperage are employed, "tight," intended for liquids, and "slack," for dry articles. Red gum leads all other woods for staves in slack cooperage, with pine, beech, elm, maple and other woods following in the order named. For heading, pine is consumed in twice the amount of any other wood, and beech stands second, with red gum third. Elm is chiefly used for hoops. White oak is the best "tight"-cooperage wood; the pores or vessels are plugged by tyloses. The waste of wood in the manufacture of "tight" staves in the past has been very great, but utilization now is closer, and material which would have been thrown away formerly is now converted into other products. —*Chas. H. Otis.*

1458. McCARTHY, E. F. **Observations on unburned cut-over lands in the Adirondacks.** Jour. Forestry 17: 386–397. *Fig. 1–2.* 1919.—Logging methods must insure the destruction of hardwoods to insure a stand of spruce as the diameter limit favors the hardwoods through cleaning up the forest and reducing the fire risk, while the heavy cutting of hardwoods increases the fire risk through slash accumulations and encourages hardwood reproduction. In the latter method softwood trees mature more quickly than in the diameter limit method, but the slow growth and late recovery of spruce necessitate subsequent cuttings of hardwoods before the spruce will make a free growth. Hardwoods can be produced in this type of excellent quality in a short time in spite of the desire to commit it to a pure coniferous forest. —*E. N. Munns.*

1459. MELLSTROM, GÖSTA. **Skogsträdens frösättning år 1918.** [See production of forest trees in 1918.] Meddel. Statens Skogsförsöksanst. 16: 1–26. *4 fig.* 1919.—The article gives a survey of the seed crop of the more important forest trees in Sweden in 1918, and a statement of the amounts available for reforestation. The supplies throughout the country are below normal, due partly to deficient production and partly to the scarcity of labor for collection.—*G. A. Pearson.*

1460. MUNNS, EDW. N. **Control of flood water in southern California.** Jour. Forestry 17: 423–429. *1 fig.* 1919.—Flood control work in the United States on a definite scale began in the San Gabriel Mountains with the installation of check dams. The influence of these on the run-off during a subsequent flood period is described in detail.—*E. N. Munns.*

1461. NEGER, F. W., AND G. BÜTTNER. **Der forstbotanische Garten (Forstgarten) zu Tharandt.** [**The Tharandt Arboretum.**] Tharandter Forst. Jahrb. 70: 33–71. *5 pl.* 1919.—A brief description of location and size, and of soil and climatic conditions, is given, together with statement of purpose of arboretum. A list of the principal trees and shrubs is cited. This arboretum is now over 100 years old and contains many fine trees, among them being a number of exotics.—*Hermann Krauch.*

1462. OLMSTED, FREDERICK E. **The work ahead.** Jour. Forestry 17: 227–235. 1919.—Two tasks confront the forester at the present time due to a lack of understanding on the part of the lumberman as to their relationship to national welfare: (1) to compel the private owner of forest lands to keep his soils productive; (2) to decide whether timber lands should be in private or public ownership, and how they should be managed and controlled.—*E. N. Munns.*

1463. PETERS, J. G. **A program of forest conservation for the south.** Jour. Forestry 17: 364–370. 1919.—Little can be done to induce the southern states to grow timber unless definite figures can be given them. Coöperation between the states and the government is necessary in the classification of lands, the acquisition of cut-over and waste lands, coöperation with private owners and in research work.—*E. N. Munns.*

1464. RIDSDALE, P. S. **War's destruction of British forests.** Amer. Forestry 25: 1027–1040. *16 fig.* 1919.—A letter written in London, Feb. 8, 1919, discussing the cutting of British forests for wartime needs, reafforestation and future forest activity, together with a brief history of British forests.—*Chas. H. Otis.*

1465. SPARHAWK, W. N. **Comment on Professor Terry's article.** [Criticism of: TERRY, E. W. **A formula method for estimating timber.** Jour. Forestry 17: 413–421. *1 fig.* 1919. See Bot. Absts. 3, Entry 1467.)] Jour. Forestry 17: 421–422. 1919.—A method is given whereby the values of the constant can be obtained much more quickly than in the original manner.—*E. N. Munns.*

1466. STUART, R. Y. **Scouting for timber in the eastern Pyrenees.** Amer. Forestry 25: 1193–1198. *5 fig.* 1919.—Notes on the trees and stands and French logging methods in the forests in the Departments of Aude and Tarn.—*Chas. H. Otis.*

1467. Terry, E. I. **A formula method for estimating timber.** Jour. Forestry 17: 413–421. *1 fig.* 1919.—A formula is worked out to determine the volume in board feet by using the breast-high diameter, the merchantable length, the merchantable form factor and the ratio of board feet to cubic feet. Using the derived formula, a constant is determined for each diameter class which will give the board-foot volume of a tree when multiplied by the length of the tree. Plotting these values and smoothing off the curve, a volume table can readily be constructed. [See also Bot. Absts. 3, Entry 1465.]—*E. N. Munns.*

1468. Toumey, J. W. **Need for a unified forest research program.** Jour. Forestry 17: 281–289. 1919.—Research in forest problems in the United States has been left largely to the Forest Service which is primarily an administrative organization. A unification and coordination of forest research in the various educational centers is needed and an experiment station should be established, with government aid, in each state.—*E. N. Munns.*

1469. Wirt, G. H. **Pennsylvania's opinion.** Amer. Forestry 25: 1283–1284. 1919.—(A contribution to the general topic "A national forest policy.") The writer believes that the most essential factor in the national program must be educational work. Other suggestions are made as to secondary provisions.—*Chas. H. Otis.*

GENETICS

George H. Shull, *Editor*

1470. Anonymous. **Inheritance studies with poultry at the Rhode Island Experiment Station.** Rhode Island State College Bull. 13: 41–42. 1918.—Part of the Director's Annual Report, covering progress of the work under way.—*H. D. Goodale.*

1471. Coe, H. S. **Origin of the Georgia and Alabama varieties of velvet bean.** Jour. Amer. Soc. Agron. 10: 175–179. *2 fig.* 1918.—The Florida velvet bean (*Stizolobium Deeringianum*) requires a frost-free season of 8–9 months. In 1906 some early-maturing velvet beans were found in Summer, Georgia, growing from seeds which had been raised there. The plants were small, and ripened their first pods three months or more after sowing. They gave constant early progeny. In 1908 a similar mutant was observed at Broxton, Georgia; this time from Florida-grown seed. A different mutant was found at Flomaton, Alabama. In 1911 one plant in a field of Florida-grown seeds was seen to flower and mature earlier. Its progeny were constant, ripening in six months or less, and were larger than the Georgia mutant. In consequence of the discovery of these early varieties, the area under velvet beans has increased, in the past three years, from less than one million, to more than three million acres.—*John Belling.*

1472. Collins, G. N. **Structure of the maize ear as indicated in Zea-Euchlaena hybrids.** Jour. Agric. Res. 17: 127–135. *Pl. 16–18, 1 fig.* June 16, 1919.—Second and subsequent generations of *Zea-Euchlaena* hybrids grade back to the parental types and form a complete series of intermediates. In analysing the hybrids it was found necessary to consider as a morphological unit the association represented by a paired sessile and pedicelled spikelet as they occur in the staminate inflorescence. This unit has been designated "alicole."—With respect to the pistillate inflorescence all stages are found between the simple spike of *Euchlaena* and the many-rowed ear of maize. In none of these intermediates is there found anything which could serve as support for either the fasciation or "reduced branch" methods of forming a many-rowed spike but on the contrary a third method is clearly indicated. This is by a shortening and twisting of the rachis of a single spike of *Euchlaena* accompanied by an increase in the number of alicoles. Further support for this method is found on ears of pure maize which reduce the number of rows in passing from the base to the tip. In these cases the loss is almost invariably two rows and both are lost at the same distance from the butt of the ear, leaving no region with an odd number of rows. Although two rows are dropped at once they are not adjacent but are nearly on opposite sides of the ear. This is what should

occur if the two-pedicelled spikelets were dropped simultaneously from a pair of yoked alicoles and accords with the hypothesis that the ear of maize is the result of the twisting of a simple four-rowed branch.—While the evidence of *Zea-Euchlaena* hybrids seems to require the hypothesis suggested, there are facts of other kinds which are more easily interpreted by the theories of fasciation and reduction of branches and still others which do not seem to accord with any of the theories yet proposed. The author concludes that until the apparently contradictory evidence can be reconciled it is best to keep the several possibilities in mind and await additional evidence before attempting a complete interpretation. [See Bot. Absts. 3, Entry 2421.]—*J. H. Kempton.*

1473. DAHLGREN, K. V. OSSIAN. **Erblichkeitsversuche mit einer dekandrischen Capsella bursa-pastoris (L.). [Genetical investigations with a decandrous Capsella bursa-pastoris L.]** Svensk Bot. Tidsskr. 13: 48–60. *2 fig.* 1919.—Detailed history of the occurrence of apetalous forms of *Capsella* and recognition of fact that these are not homogeneous. Two types of apetaly are recognized, (a) in which petals are replaced by stamens (decandrous), and (b) in which petals simply fail (hexandrous). Genetical experiments were conducted with the former type, in crosses with two of Almquist's elementary species, *Capsella collina* and *C. emarginata*, and also with *C. Heegeri* and *C. grandiflora*. With *C. grandiflora* numerous attempts failed to produce hybrids, except in one case in which a sterile plant was produced which was probably such hybrid. In crosses with the other three forms, the F_1 generation was intermediate, but not always easily distinguishable in the F_2 from the apetalous type. When these intermediates are counted with the apetalous plants, the 3 : 1 F_2 ratio is closely approximated. Totals are 106 : 40, 44 : 16, 746 : 298, 1208 : 443; grand total, 2104 : 797. The cross with *C. Heegeri* gave 394 with triangular capsules to 17 top-shaped, thus indicating the presence of two genes for the triangular form, and the usual deficiency of the recessive *Heegeri* type. Author cites further evidence that this deficiency is due to relative weakness of the *Heegeri* type. [See Bot. Absts. 3, Entry 616.]—*Geo. H. Shull.*

1474. DEHAUT, E. G. **Développement en sens inverse de la coloration verte, chez Lacerta muralis tiliguerta et L. mur. quadrilineata. [Development of green coloration in reverse direction in Lacerta muralis tiliguerta and L. mur. quadrilineata.]** Compt. Rend. Soc. Biol. 82: 514–515. May 17, 1919.—Fundamental dark color of young, probably primitive, gives way in variable degree to green, which extends from behind forward in *quadrilineata* and in reverse direction in *titiquerta*. Green color has probably been developed independently in different forms under influence of natural selection.—*P. W. Whiting.*

1475. DEHAUT, E. G. **Interversion d'un caractère cranien dans certaines races du Sus scrofa. [Interversion of a cranial character in certain races of Sus scrofa.]** Compt. Rend. Soc. Biol. France 82: 515–516. May 17, 1919.—Wild *Sus scrofa* and domestic continental swine do not belong to different species, although angle made by plane of occiput and frontals is acute in former and obtuse in latter. All gradations between these two forms are seen in the Corsican and Sardinian swine.—*J. A. Detlefsen.*

1476. DE VRIES, HUGO. **Über erbliche Ursache eines frühzeitigen Todes. [On hereditary causes of early death.]** Die Naturwiss. 7: 217–222. 1919.—A list is given of plants commonly producing seeds which develop into yellowish or etiolated seedlings (6 to 30 per cent) which soon die. Author seeks the cause of the development of such seedlings in a mutation characterized by the loss of the factor which has to do with the production of normal green coloring in the seedling. There may be a number of other factors the loss of which by mutation also causes an early death of the seedling. These lethal factors follow in hybridization typical Mendelian ratios as pointed out for *Linaria vulgaris* as well as for several species of *Oenothera*. Two interesting mutants, *Oenothera Lamarkiana* mut. *simplex* and mut. *velutina* are noted where the lethal factors (there seem to be two in these cases) which cause normally 50 per cent sterile seed, are suddenly lost and all the seed produce viable seedlings.—*Orton L. Clark.*

1477. DE VRIES, HUGO. **Das Wandern der Pflanzen. [The migration of plants.]** Die Naturwiss. 7: 81–89. 1919.—See Bot. Absts. 4, Entry 324.

1478. Dorsey, M. J. **Relation of weather to fruitfulness in the plum.** Jour. Agric. Res. 17: 103–126. *Pl. 13–15, 1 fig.* June 16, 1919.—A summary of evidence bearing on the influence of weather on pollination and fertilization in the plum. Conclusions are based on studies of others and on personal investigations. Observations of field conditions in Minnesota, from 1912–1918 inclusive, are supplemented by greenhouse experiments and by cytological studies.—Rain and low temperatures during periods of bloom are the most important factors of weather. Rain prevents or delays dehiscence of anthers and interferes with activity of insects. But anthers that have already opened will close under influence of rain without much loss of pollen, and pollen is not seriously injured by rain as has been very generally believed. The washing of pollen from stigmatic surfaces by rain is not an important factor. Prolonged periods of rain reduce fruitfulness chiefly by interfering with and delaying the proper dissemination of pollen.—Periods of low temperature ranging from 40° to 51° decidedly retard growth of pollen tubes and thus vitally influence fertilization. Pistils are receptive from 4 to 6 days, abscission of styles occurs from 8 to 12 days after flowers open, and pollen tubes normally make slow growth. Conditions which retard growth of pollen tubes therefore render fertilization uncertain. The severe effects of frosts are only occasional in Minnesota.—Wind pollination is found to be insufficient. Strong winds at critical times affect fruitfulness by interfering with activities of insects.—"Each season certain sets of conditions can be singled out as being largely responsible for the status of the setting of fruit," but practical means of controlling rain, temperature, and wind "under orchard conditions do not appear readily available." The author concludes that "since tube growth seems to be the process most directly affected by low temperatures, remedial measures can most effectively be sought in suitable pollinizers which show the fastest tube growth." [See Bot. Absts. 3, Entry 1529.] —*A. B. Stout.*

1479. Faure, Ch. **Note sur un cas d'hermaphroditisme rudimentaire chez le coq.** [*Note on a case of rudimentary hermaphroditism in the cock.*] Compt. Rend. Soc. Biol. France 82: 519–520. May 17, 1919.—Brief description of a bird regarded by the author as an instance of false hermaphroditism in the domestic fowl.—*H. D. Goodale.*

1480. Frets, G. P. [Rev. of: Schallmayer, W. **Vererbung und Auslese. Grundriss der Gesellschaftsbiologie und der Lehre vom Rassedienst.** (**Heredity and selection, fundamentals of social biology and science of race improvement.**) *3rd ed., 8vo., xvi + 536 p.* Gustav Fischer: Jena, 1918. (See Bot. Absts. 2, Entry 704.) Genetica 1: 492–495. Sept., 1919.

1481. Goedewaagen, M. A. J. [Rev. of: Davis, B. M. **Some inter- and back-crosses of F_1 Oenothera hybrids.** Genetics 2: 155–185. 1917.] Genetica 1: 466–468. Sept., 1919.

1482. Haecker, V. [Rev. of: (1) Trl'benbach, P. **Plymouths in Wort und Bild.** (**Plymouth Rocks in description and illustration.**) Geflügelwelt (Chemnitz) *96 p., 50 fig.* 1913. (2) Idem. **Weisse Wyandottes, ihre Zucht und Pflege.** (**White Wyandottes, their breeding and care.**) *Ibid. 100 p., 2 pl., 107 fig.* 1915.] Zeitschr. indukt. Abstamm. Vererb. 20: 160–173. *18 fig.* Jan., 1919.

1483. Harper, R. A. **The structure of protoplasm.** Amer. Jour. Bot. 6: 273–300. 1919. —See Bot. Absts. 3, Entry 2133.

1484. Ikeno, S. **Idengaku de iwayuru "korosu" Gen ni tuite.** [**On the so-called "lethal" factor in genetics.**] (Japanese.) Rigakukwai [Scientific World] 16: 881–886. 1919.—A popular paper concerning lethal and semi-lethal factors. Illustrations are given both from vegetable and animal kingdoms. [See Bot. Absts 3, Entries 1934, 2133.]—*S. Ikeno.*

1485. Jones, W. N. **On the nature of fertilization and sex.** New Phytol. 17: 167–188. 1918.—Interpretation of sex phenomena in both animals and plants by postulating the existence of two sets of sex agents: (1) those determining the sex of the individual, inherited according to the ordinary Mendelian scheme (the sex chromosome or factors). These may be

carried indifferently by either sperm or egg and therefore can not be the same as (2) the agents determining the type of the gametes themselves, as seen particularly in hermaphroditic species. The egg and sperm are considered to be composed of either "active," androplasmic or "passive" gynoplasmic protoplasm. The union of these substances at fertilization is considered as a form of parasitism and their continuation in the zygote as a symbiosis. Before gamete formation occurs separation of these two substances takes place in such a way that certain gametes (the eggs) are predominatingly gynoplasmic while others (the sperms) are androplasmic. This separation of the two different kinds of protoplasm is not the same as the segregation of the sex factors or sex chromosomes. Each kind of protoplasm may retain the potentiality of the other so that apogamously developed eggs may therefore still possess the capability of producing the other type of zygote.—*D. F. Jones.*

1486. KOOIMAN, H. N. [Rev. of: LOTSY, J. P. **Mutatie of kruising de oorzaak der evolutie? [Mutations from crossing the cause of evolution?]** Nederland. Tijdschr. Geneeskunde 17: 1395–1404. 1918. (See Bot. Absts. 4, Entry 652.) Genetica 1: 484–485. Sept., 1919.

1487. KRAUS, E. J., AND H. R. KRAYBILL. **Vegetation and reproduction with special reference to the tomato (Lycopersicum esculentum).** Oregon Agric. Exp. Sta. Bull. 149. *90 p. 11 fig.* 1918.—The chemical and physical requirements of tomato plant, particularly with respect to available nitrogen and moisture supply and opportunity for carbohydrate synthesis, are closely associated with its ability to set and mature fruit; hence heredity, as expressed in yield, may not always be the limiting factor in productiveness. With our present knowledge of the subject, both environmental and hereditary factors must be considered in attempting to explain reproduction or vegetative behavior of plants. [See Bot. Absts. 1, Entry 1402.]—*C. E. Myers.*

1488. KUIPER, K. [Rev. of: PUNNETT, R. C., AND THE LATE MAJOR P. G. BAILEY. **Genetic studies in poultry. I. Inheritance of leg-feathering.** Jour. Genetics 7: 203–213. May, 1918. (See Bot. Absts. 1, Entry 492.)] Genetica 1: 491–492. Sept., 1919.

1489. LILLIE, FRANK R. **Tandler and Keller on the free-martin.** Science 50: 183–184. August 22, 1919.—Author calls attention to a paper by Tandler and Keller (Deutsche tierärztl. Wochenschr. 19: 148–149. 1911) in which evidence was presented, indicating that a heifer calf, twin with a male, is malformed and sterile whenever there is anastomosis of her blood vessels with those of the male twin in the fused chorions. In one case out of seventeen there was no macroscopic vascular anastomosis and only in this case was the female twin normal. It is noted that the conclusions are the same, as far as they go, as those reached wholly independently by author (Jour. Exp. Zoöl. 23: 371–452. 1917).—*Sewall Wright.*

1490. LOTSY, J. P. [Rev. of: BATESON, W. **Root-cuttings, chimaeras and "sports."** Jour. Genetics 6: 75–80. *1 pl.* Dec., 1916.] Genetica 1: 457–458. Sept., 1919.

1491. LOTSY, J. P. [Rev. of: KOOIMAN, H. N. **Over de beteekenis van het kruisen van individuen, behoorend tot verschillende Linnésche soorten, voor het ontstaan onzer huisdieren. On the significance of crossing of individuals belonging to different Linnean species, for the origin of our domestic animals.**] Ardea 7: 108–114. 1918. (See Bot. Absts. 4, Entry 636.) Genetica 1: 475–478. Sept., 1919.

1492. LOTSY, J. P. [Rev. of: LEHMANN, E. **Ueber reziproke Bastarde zwischen Epilobium roseum und parviflorum. (On reciprocal hybrids between Epilobium roseum and E. parviflorum.)** Zeitschr. Bot. 10: 497–511. 1918. (See Bot. Absts. 3, Entry 266.)] Genetica 1: 478. Sept., 1919.

1493. LOTSY, J. P. [Rev. of: MORGAN, T. H., A. H. STURTEVANT, H. J. MULLER, AND C. B. BRIDGES. **The mechanism of Mendelian heredity.** *262 p., 64 fig.* H. Holt and Co.: New York, 1915.] Genetica 1: 486–491. Sept., 1919.

1494. Matouschek. [Rev. of: Correns, C. **Fortsetzung der Versuche zur experimentellen Verschiebung des Geschlechtsverhältnisses. (Continuation of the attempt to experimentally shift the sex ratio.)** Sitz.-Ber. Preuss. Akad. Wiss. Berlin 1918: 1175–1918.] Zentralbl. Physiol. 34: 18–19. 1919.

1495. Matouschek. [Rev. of: Raunkiaer, C. **Über den Begriff der Elementarart im Lichte der modernen Erblichkeitsforschung. [On the concept of elementary species in the light of modern genetical investigations.]** Zeitschr. indukt. Abstamm. Vererb. 19: 225–240. *8 fig.* 1918. *(See Bot. Absts. 2, Entry 41.)*] Zentralbl. Physiol. 34: 71. 1919.

1496. Meyer, A. W. **The occurrence of superfoetation.** Jour. Amer. Med. Assoc. 72: 769–774. 1919.—Cases cited in women in which one embryo of twin pregnancy dies, but surviving embryo may continue to grow for some time. Thus differences in size and development between the two embryos has frequently led to erroneous conclusions of superfoetation. Author suggests that similar cases in other forms (cat, cow, rat) may have been incorrectly called superfoetation.—*J. A. Detlefsen.*

1497. Moore, Carl R. **On the physiological properties of the gonads as controllers of somatic and psychical characteristics. I. The rat.** Jour. Exp. Zoöl. 28: 137–160. *5 fig.* May 20, 1919.—Author has repeated Steinach's experiments on the heterosexual transplantation of the gonads in rats. He confirms Steinach's conclusions that spayed females into which testes have been transplanted, exhibit, when mature, the sexual instincts of the male. Likewise, castrated males into which an ovary has been grafted, exhibit the sexual and parental instincts of the female. Other secondary sexual differences, such as differences in body weight, length and size of skeleton, condition of pelage, and fat deposition, are too variable to warrant their use as indicators of a specific response to the influence of the gonads and hence Steinach's conclusions in respect to these characters are not confirmed. The transplanted ovaries are nearly normal and may ovulate. The transplanted testes consist mainly of interstitial cells, with scattered tubules lacking spermatocytes or spermatozoa.—*H. D. Goodale.*

1498. Moore, Carl R. **On the physiological properties of the gonads as controllers of somatic and psychical characteristics. II. Growth of gonadectomized male and female rats.** Jour. Exp. Zoöl. 29: 459–467. *1 fig.* July 5, 1919.—A comparison of the growth curve of gonadectomized males with that of gonadectomized females, shows that the former is at the higher level, though the latter curve is higher than that for intact females.—*H. D. Goodale.*

1499. Nohara, S. **Sō, sonohoka Nikun no Daikon no hi-Mendel-sei Iden ni tuite [On the non-Mendelian inheritance of Raphanus sativa by Sō and two other authors.]** [In Japanese]. Bot. Mag. Tōkyō 33 (Japanese part): 141–144. 1919.—Author thinks that the so-called non-Mendelian inheritance of Sō, Imai and Terasawa in *Raphanus sativa* (Bot. Absts. 2, Entry 956) might well be Mendelian, and that the non-existence of homozygous red forms might be explainable on the basis of the presence of a lethal factor.—*S. Ikeno.*

1500. Reimers, J. H. W. Th. **De studie der afstammingen, der bloedlynen en de karakteristiek van onze rundveerassen. [Study of the origin, the bloodlines and the characteristics of our races of cattle.]** Cultura 30: 328–353. 1918.—Writer presents his method of study of descendance and of bloodlines, aiming to find characteristics of the different families constituting our races of cattle. He gives as examples, the characteristics that are used in systems of cattle-judging, the measurements of different parts of the body, production of milk, and fat-content of the milk. These characteristics are studied relative to three well-known bulls which are kept for breeding in the Dutch province of Friesland and they show very well the usefulness of the writer's method.—*M. J. Sirks.*

1501. Schaffner, John H. **The nature of the dioecious condition in Morus alba and Salix amygdaloides.** Ohio Jour. Sci. 19: 409–416. 1919.—See Bot. Absts. 3, Entry 1575.

1502. SCHAFFNER, JOHN H. **Complete reversal of sex in hemp.** Science 50: 311–312. Sept. 26, 1919.—Hemp grown in winter in greenhouse matures very early, never more than a few inches high. The plants are decidedly dimorphic, carpelled and staminate. The two types are briefly described. Some staminate plants later produce intermediate structures, part ovulary and part stamen. These intermediate plants usually become purely staminate toward the end of the season. Carpelled plants are usually purely carpellate at first but may later develop stamens in some flowers. Most of the carpellate plants show this reversal of sex only on attaining advanced age. There is much variation in the age at which the change is produced, and in the degree of perfection of stamens and anthers. In one plot over 50 per cent of the plants that produced only female characters at first were finally producing only typical male characters. "Female heredity is at first active and male heredity latent, and finally male heredity is active and female heredity is latent."—*Geo. H. Shull.*

1503. SCHAFFNER, JOHN H. **Unusual dichotomous branching in Vernonia.** Ohio Jour. Sci. 19: 487–490. 1919.—See Bot. Abstr. 3, Entry 1574.

1504. SCHULTZ, WALTHER. **Versteckte Erbfaktoren der Albinos für Färbung beim Russenkaninchen im Soma dargestellt und rein somatisch zur Wirkung gebracht. [Hereditary color factors hidden in albino Russian hares, demonstrated in the soma, and purely somatically activated.]** Zeitschr. indukt. Abstamm. Vererb. 20: 27–40. *9 fig.* Sept., 1918.—Hybridization has demonstrated that Himalayan (Russian) albino and true albinos may carry latent and transmit all the color and pattern factors which a colored rabbit carries, except the color factor itself. Existence of these latent factors in some may be directly demonstrated by experiment. In Himalayan, factors for self color and black appear activated when any part of the body is depilated and new hair is grown subject to the external stimuli, temperature and heat. Black hair may be grown even on belly (protected region difficult to influence) by depilating and keeping animal in light room at approximately freezing temperature. Depilated areas in colored rabbits and true albinos regenerate colored and white hair respectively, but in the Himalayan such depilated areas grow black hair except at the border of this depilated area where border hairs protect bare skin. When Himalayan was kept very warm, the entire depilated area regenerated only white hair. Author believes this demonstrates difference between C, color factor, and C_1, factor for Himalayan condition, and c the factor for complete albinism.—In true albino, various latent colors and color patterns were similarly activated. New characters such as dapple, zebra-like markings, and heel-spot appeared. Author believes these new characters predict possibility of germinal mutation in same direction at some future time.—*J. A. Detlefsen.*

1505. SEILER, J. **Researches on the sex-chromosomes of Psychidae (Lepidoptera).** Biol. Bull. 36: 399–404. *1 pl., 1 fig.* June, 1919.—In *Talæporia tubulosa* Retz., first oöcyte division shows 30 chromosomes, one of which fails to divide. Daughter plates show 29 or 30 chromosomes. In 134 cases the odd element passed outward, in 89, inward. This gives an expectation of 1.5 females to 1 male. First and second spermatocyte divisions show 30 chromosomes. 30 embryos showed 59 chromosomes and 25 showed 60. Sex ratio as determined by chromosome counts from embryos from Tornow material exactly agreed with distribution of X element. Four embryos, possibly parthenogenetic, showed 58 chromosomes and two divisions of first oöcyte showed 29 passing to each pole. *Fumea casta* Pall. has 31 chromosomes in first oöcyte. Daughter plates show 31 or 30 chromosomes. Embryos have 61 or 62.—*B. Wolf, Jr.*

1506. SIEMENS, H. W. [Rev. of: PRIBRAM, DR. HUGO. **Über die Vererbung der diabetischen Konstitution. (On the inheritance of the diabetic constitution.)** Zentralbl. innere Med. 36: 1915.] Zeitschr. indukt. Abstamm. Vererb. 20: 158. Jan., 1919.

1507. SIEMENS, H. W. [Rev. of: RÜDIN, PROF. DR. ERNST. **Studien über Vererbung und Entstehung geistiger Störungen. I. Zur Vererbung und Neuentstehung der Dementia praecox. Studies on inheritance and origin of mental disturbances. I. On the inheritance and new origin of dementia praecox.)** *vi + 172 p.* Julius Springer: Berlin, 1916.] Zeitschr. indukt. Abstamm. Vererb. 20: 157–158. Jan., 1919.

1508. Siemens, H. W. [Rev. of: Wegelin, Prof. Carl. **Über eine erbliche Missbildung des kleinen Fingers.** (On an hereditary abnormality of the little finger.) Berliner Klin. Wochensch. 54: 1917.] Zeitschr. indukt. Abstamm. Vererb. 20: 159. Jan., 1919.

1509. Sirks, M. J. [Rev. of: Hagedoorn, A. L., and A. C. **Rattensoorten.** (Rat species.) Teysmannia 28: 1–23. 1917.] Zeitschr. indukt. Abstamm. Vererb. 20: 160. Jan., 1919.

1510. Sirks, M. J. [Rev. of: Kajanus, B., and S. O. Berg. **Pisum-Kreuzungen.** (Pea crosses.) Arkiv Bot. 15: 1–18. 1919.] Genetica 1: 470–471. Sept., 1919.

1511. Sirks, M. J. [Rev. of: Morgan, T. H. **Heredity and sex.** *284 p., 121 fig.* Columbia University Press: New York, 1914.] Genetica 1: 485–486. Sept., 1919.

1512. Sirks, M. J. [Rev. of: Tjebbes, K. **Sur les rapports génétique entre Thaumalea picta et Thaumalea obscura Schlegel. D'après les études expérimentales de M. le Dr. J. H. Kruimel.** (Über die genetischen Beziehungen zwischen Thaumalea picta und Thaumalea obscura Schlegel.) (On the genetical agreement between Thaumalea picta and S. obscura Schlegel. From an experimental investigation of Dr. J. H. Kruimel.) Arch. Néerland. Sci. Exactes et Nat. III B, 3: 316–323. 1917.] Zeitschr. indukt. Abstamm. Vererb. 20: 175–176. Jan., 1919.

1513. Sirks, M. J. [Rev. of: Ziegler, H. E. **Die Vererbungslehre in der Biologie und in der Soziologie.** [Genetics in biology and sociology.] *xvi + 480 p., 8 (partly colored) pl., 114 fig.* Gustav Fischer: Jena, 1918. (See Bot. Absts. 2, Entry 963.)] Genetica 1: 496. Sept., 1919.

1514. Sô, M., and Y. Imai. **Daikon no Iden Hôkoku ni taisuru Nohara Udi no Hihyô ni tuite.** [On the critique of Mr. Nohara against our report on the inheritance of Raphanus sativa.] [Japanese]. Bot. Mag. Tôkyô 33 (Japanese part): 172–173. 1919.—Against the opinion of Nohara (See Bot. Absts. 3, Entry 1500), authors think that their work on the inheritance of *Raphanus* is not explainable on the basis of the action of a lethal factor. They do not, however, try to explain the results of their work.—*S. Ikeno.*

1515. Stein, E. [Rev. of: de Vries, H. **Die endemischer Pflanzen auf Ceylon und die mutierenden Oenotheren.** (The endemic plants of Ceylon and the mutating Oenotheras.) Biol. Centralbl. 36: 1–11. 1916.] Zeitschr. indukt. Abstamm. Vererb. 20: 176. Jan., 1919.

1516. Stoll, Norman, R., and A. Franklin Shull. **Sex determination in the white fly.** Genetics 4: 251–260. May, 1919.—Breeding experiments with "white fly," *Aleurodes vaporariorum*, show that virgin females yield males; mated females, both sexes. In three cases male ratio from mated females was very low, disproving theory that fertilized eggs yield males and females in equal numbers. Male offspring produced by mated females are assumed to result from parthenogenetic development of unfertilized eggs, and it is concluded that fertilized eggs yield females; unfertilized, males.—*B. Wolf, Jr.*

1517. Stout, A. B. **Intersexes in Plantago lanceolata.** Bot. Gaz. 68: 109–133. *Pl. 12–13.* Aug., 1919.—The observations reported refer almost entirely to maleness. There is a wide variation in the development of stamens among different plants, among various flowers of the same spike or even among stamens of a single flower. Functionally the variation ranges from pure maleness to pure femaleness. The stamens of pure male flowers are generally, but not necessarily, well developed, pollen grains germinate normally but flowers do not set any seed, neither when selfed nor cross-pollinated, pistils are present but they are impotent. In intermediates the filaments are not as well developed as in pure males but anthers make pollen grains which are not viable, pistils are potent and set good seeds. In pure females stamens vary in development from traces of the four anthers to fully sterile

tissue. In the latter case the corolla is generally closed and this may be considered as a secondary sex character associated with pure femaleness, appearing when maleness is most completely lacking. In a few cases stamens as well as pistils are sterile. So there is every step of variation in which maleness is expressed. Femaleness also varies in the degree of its expression. Classification is impossible. Conclusions: (1) Fundamentally, maleness and femaleness reside in all somatic cells of all sporophytic individuals. (2) Maleness and femaleness are quantitative differentiations, they are relative; there are all grades of intersexes and all grades of compatibilities. (3) Sex determination at least in hermaphrodites, is fundamentally a phenomenon of somatic differentiation that is ultimately associated with processes of growth, development and interaction of tissues and subject to modification or even complete determination by them.—*C. A. Gallastegui.*

1518. SWINGLE, WALTER T., AND T. RALPH ROBINSON. **Tangelos: What they are. The value in Florida of the Sampson and Thornton tangelos.** U. S. Dept. Agric. Bur. Plant Ind. Crop] P[hysiology] & B[reeding] I[nvestigations] [Circular] 4. *3 p.* 1918.—Crosses between the tangerine orange and the grapefruit have been made, producing a new type of fruit named tangelos. The fruits resemble round oranges more than either of their parents and are exceedingly variable. Fruits of sister plants from seeds of a single cross-pollinated fruit are often very unlike. Second-generation seedlings resemble the F_1 plant almost as closely as though grown from a bud.—There are now two well recognized varieties of tangelos, called the Sampson and Thornton. The fruit of the Sampson variety is pear-shaped with a smooth, thin pale orange skin and an acid, soft, juicy, deep orange-colored pulp. The fruits vary in size though they are usually larger than an average orange.—The fruit of the Thornton tangelo is of a very different type having a rough thick skin with a very pale orange-colored juice. It has little acidity and resembles a good-flavored orange more than it does a grape fruit or a tangerine but resembles the tangerine in having a free rind.—The success of these two tangelos has led to the creation of hundreds of additional hybrids between tangerine oranges and grape fruit and while all of these have not been thoroughly tested there is reason to believe that some of them will prove to be resistant to the citrus canker.—*J. H. Kempton.*

1519. TAMMES, T. **De veredeling van het vlas in Nederland. [Flax-breeding in Holland.]** Mededeel. Vereen. Wetensch. Teelt Nederland. 9. *19 p.* 1918.—Discusses four points relative to flax-culture and flax-breeding: (1) the measures taken in the different flax-growing countries to improve the methods of culture; (2) improvement of technical manufactures of the gathered products; (3) means of propagating flax-growing; and (4) the results thus far obtained in flax-breeding. This last-named subject is the most important in the author's paper; but the other three are also discussed in a most interesting manner. The perpetual propaganda, made by the governments in the different countries, did not yield any result; flax-diseases and other circumstances, (as the renewed import of cotton after finishing the American Civil War (1865) were fatal to the flax-culture in many countries (especially in the Dutch province of Groningen).—The scientific method of amelioration, by breeding new and better strains of flax must save the culture; the researches necessary for this work are at present time of great importance. Great difficulties are met: flax-growers make their cultures in a manner that gives always abnormally developed and etiolated plants; these plants are much more feeble and much less resistant to diseases (flax-wilt, etc.). Flax-wilt may be controlled in two ways: (1) By chemical means, none of which are applicable in practice, and (2) by breeding new immune strains. Author has one such immune strain now in cultivation, but this strain has stems too thick and too short for satisfactory use as an economic strain. The so-called "process of degeneration" is of importance; if the grower himself harvests each year the seeds necessary for his cultures in the following year, the cultures grow steadily worse. Each three or four years newly imported Russian seed must be used for sowing to cope with this degeneration. The Russian seed is always a mixture of several types of plants that may be isolated and which give posterities with great differences in hereditable characters. Such a field of flax is not at all a homogeneous culture, but problems of manufacture make homogeneity of great importance. The process of degeneration

mentioned above, results from an unintentional selection of the strongest, most branched plants, that give also much more seeds than the fine-stemmed and feeble plants that are the "ideal" of the flax-grower.—The appearance of blue-blooming plants in white-blooming *races of flax (as in the white Friesian) is due to the presence of complementary factors* in the different white-blooming plants. Crossing two white-flowering plants, possessing these complementary factors give an F_1 of blue-flowered ones. By means of selection of pure lines that belong to one of the two types, author shows that it is possible to obtain strains that give only white-flowering and never blue-flowering plants in their posterities.—These difficulties of flax-growing may be diminished by scientific selection. Author mentions results already obtained and indicates new lines, along which new and better races of flax may be bred. Besides selection, hybridization may be also practised to build up new races that combine favorable characters from different pure lines, into one strain.—*M. J. Sirks.*

1520. Tammes, Tine. [Rev. of: Frets, G. P. **Mendelistische splitsingsverschynselen by de erfelykheid van denhoofd-vorm. (Mendelian segregation in the inheritance of head form.)** K. Akad. Wetensch. Amsterdam 26: 367–380 1917.] Zeitschr. indukt. Abstamm. Vererb. 20: 159. Jan., 1919.

1521. Trouard-Riolle, Y. **Radis sauvages et radis cultivés. [Wild and cultivated radishes.]** Revue Horticole 91: 244–245. *Fig. 78–81.* Mar., 1919.—See Bot. Absts. 3, Entry 1556.

1522. von Derschau, M. **Über disperme Befruchtung der Antipoden bei Nigella arvensis. [Dispermic fertilization of antipodals in Nigella arvensis.]** Ber. Deutsch. Bot. Ges. 36: 260–262. *1 pl.* 1918.—In the material of *Nigella*, normal embryos had mostly perished early. Antipodals were always developed. Long-celled conductive tissue extends to the chalazal end of the ovule. A pollen-tube was observed in the chalazal tissue passing into an antipodal with one sperm in the cytoplasm, and the other sperm close by in the pollen-tube. In another ovule, two sperm nuclei were found in the act of fusing with the nucleus of an antipodal cell. No antipodal embryos were seen. Reference is made to the previous discovery of antipodal embryos in *Allium odorum*, and to dispermic fertilization of the egg-cell.—*John Belling.*

1523. Walther. [Rev. of: von Tschermak, A. **Über das verschiedene Ergebnis reziproker Kreuzung von Hühnerrassen und über dessen Bedeutung für die Vererbungslehre. (Theorie der Anlagenschwächung oder Genasthenie.) (On the different result of reciprocal crossing of domestic fowl, and on significance for genetical theory. (Theory of the weakening of the primordia or asthenia of the genes.)** Biol. Centralbl. 37: 217–277. 1917.] Zeitschr. indukt. Abstamm. Vererb. 20: 217–277. Jan., 1919.

HORTICULTURE

J. H. Gourley, *Editor*

1524. Adams, R. L. **Orchard irrigation.** Better Fruit 13[8]: 13, 20–22. Feb., 1919.—A practical and popular discussion of details of installation and management of an irrigation system. Prevailing practices and methods of distribution of water are briefly considered.—*A. E. Murneek.*

1525. Anonymous. [D. B.] **Quelques plantes nouvelles. [Some new plants.]** Revue Horticole 91: 260–262. *Fig. 84–85.* Apr., 1919.—This article lists and describes a number of the more recently introduced ornamental shrubs. The list includes: several species of *Columnea; Feijoa Sellowiana; Loropetalum Chinense;* several varieties of *Hydrangea hortensis; Actinidia purpurea; Dipleta floribunda; Pyracantha crenulata;* two species of *Spiraea;* several species of *Viburnum;* several species and varieties of *Deutzia;* several improved varieties of *Philadelphus;* a new hybrid *Dierrilla;* several varieties of lilac and other species of *Syringa* recently introduced from China.—*E. J. Kraus.*

1526. BOIS, D. **Nothopanax Davadii.** Revue Horticole 91: 212–213. *Fig. 67–68.* Jan., 1919.—The author discusses the synonymy and native range of the species and gives a fairly detailed description of both vegetative and floral characters. It is recommended for planting since it tolerates shade and was uninjured by a temperature of 20° below zero at Orleans. There appear to be no serious difficulties in propagation from seeds, which mature in the climate of France, though cuttings root very slowly.—*E. J. Kraus.*

1527. BROWN, W. S. **Art of top working and bridge grafting fruit trees.** Better Fruit 13: 12–15. Feb., 1919.—A popular review of methods and practices involved.—*A. E. Murneek.*

1528. CROW, J. W. **The relation of winter injury to soil fertility.** Canadian Hortic. 42: 57–92. 1919.

1529. DORSET, M. J. **Relation of weather to fruitfulness in the plum.** Jour. Agric. Res. 17: 103–126. *Pl. 13–16.* 1919.—A detailed analysis of the manner in which wind, temperature, sunshine and rain during blooming time of plums and for 10 days after, influence the work of bees and affect anthers, pollen, and stigma and the processes involved in pollination and fertilization. Studies indicate that rain prevents pollen dissemination by closing the anthers or by preventing them from opening, but does not burst the pollen or kill it. The stigmatic cells disintegrate rapidly after active secretion stops and the style abscisses in 8 to 12 days after bloom. Low temperature retards the pollen tube growth but apparently does not delay abscission of the style. Consequently, fertilization is uncertain during cool weather. The remedy for this condition can be sought in pollenizers which show the fastest tube growth. [See Bot. Absts. 3, Entry 1478.]—*A. J. Heinecke.*

1530. DUJARDIN, F. **L' horticulture dans les pays envahis. [Horticulture in the invaded countries.]** Revue Horticole 91: 284–285. May, 1919.—Belgian horticulture has suffered greatly. The botanic garden at Brussels suffered largely, because of lack of fuel, though many plants were well preserved. At Gand, the Casino was turned into a hospital for neurasthenics. At Laerne, near Gand, fine collections of orchids were destroyed. In France damage was done to the outdoor plantings and to hothouses particularly.—*E. J. Kraus.*

1531. DUJARDIN, F. **Les progrès de la culture potagère en Angleterre. [The advance of vegetable growing in England.]** Revue Horticole 91: 234–235. Feb., 1919.—There is an awakened interest in the growing of vegetable crops. Attention is called to the desirability of vegetable displays at exhibitions, and the need for greater care in improving soils for the growing of fresh vegetables.—*E. J. Kraus.*

1532. ENFER, V. **Eborgnage sur le poirier et le pommier. [Disbudding pear and apple trees.]** Revue Horticole 91: 269–270. Apr., 1919.—The article gives somewhat detailed directions for training and directing the shoot growth of trees, more particularly during the growing season.—*E. J. Kraus.*

1533. ENFER, V. **Pommiers cordons. [Cordon apple trees.]** Revue Horticole 91: 267–268. Apr., 1919.—Three varieties of stocks are recommended for horizontal cordons, namely; common paradise, for strong rich soils; doucin for thin, dry soils; and paradise (yellow Metz) for mellow soils not subject to excessive drouth. Training and planting directions are outlined in some detail, special emphasis being placed on the fact that the branches should not be lapped one over the other under any circumstances.—*E. J. Kraus.*

1534. GATIN, C.-L. **La maturation artificielle des fruits. [Artificial ripening of fruits.]** Jour. Agric. Tropic 19: 256–260. 1919.—See Bot. Absts. 3, Entry 1746.

1535. HUGHES, J. A. **Pruning peaches in the South.** Better Fruit 13: 6–7. Feb., 1919.—Popular, refers to southern U. S. A.

1536. Kirk, T. W. **Control of brown-rot of some fruits. The past season's experiments.** New Zealand Jour. Agric. 18: 272–284. 1919.—See Bot. Absts. 3, Entry 1638.

1537. Lamproy, E. **Le navet en culture forcée. [Forcing turnips.]** Revue Horticole 91: 230–231. *Fig. 74–76.* Feb., 1919.—This is a growing and profitable industry. The best varieties for forcing and detailed cultural directions are given. About 2 months, from the time of sowing the seeds, are required to mature the crop. Radishes may be grown in the same frame with the turnips.—*E. J. Kraus.*

1538. Lamproy, E. **Culture des carottes de primeur. [The growing of early carrots.]** Revue Horticole 91: 219–220. *Fig. 72–73.* Jan., 1919.—There is a general discussion dealing with the selection of varieties and the making and caring for the necessary hot bed. It is suggested that radishes and lettuce be interplanted with the carrots. The seeds are sown in the latter half of January. The radishes may be removed in 4 or 5 weeks after planting, the lettuce about the middle of March, and the carrots about the end of April or the early part of May.—*E. J. Kraus.*

1539. Lamproy, E. **Culture de crambe maritime. [Culture of sea-kale.)** Revue Horticole 91: 252–254. *Fig. 82.* Mar., 1919.—The general habitat and history of sea-kale (*Crambe maritima* L.) as a pot herb are discussed. Root cuttings are most generally employed in starting new plantings, though seeds may be sown. Blanching of the new spring growths is effected either by covering the plants with earth or by inverting a flower pot over each. It is possible to force the plants in winter in the open ground by digging the soil away from the plants, placing boxes and boards over them to exclude the light and then filling the spaces with horse manure, or by means of a hot bed. More general use of this vegetable is urged.—*E. J. Kraus.*

1540. L'Esprit, A. **Acacias parisiens.** Revue Horticole 91: 280. *1 pl.* May, 1919.—Considerable error exists in the various accounts concerning the introduction of the locust tree (*Robinia Pseud-acacia*) into Europe. It is here authoritatively stated that the seeds were first secured from North America by Jean Robin in 1601, and a tree still standing in the Jardin des Plantes (Paris) was planted there in 1636 by his nephew, Vespasien Robin. A poem by M. Claro dedicated to the locust tree is included in the article.—*E. J. Kraus.*

1541. Lewis, C. I. **Some interesting phases of the pruning problem.** Better Fruit 13[3]: 26–32. Feb., 1919. This is a rather extensive review of the problems and fundamental principles underlying different pruning practices. Quotations are made at length of a recent bulletin of the Oregon Agric. Exp. Sta.: "Vegetation and Reproduction with Special Reference to the Tomato." The relation of carbohydrates and nitrates in the tree is considered as the most fundamental factor in pruning. Effects of various types of pruning upon the tree, particularly its fruitfulness, are discussed.—*A. E. Murneek.*

1542. Melander, A. L. **Why surrender to the codling moth?** Better Fruit 13[3]: 33–34. Feb., 1919.—A brief popular review of steps involved in combatting the codling moth. Early, or "calyx," spraying is emphasized.—*A. E. Murneek.*

1543. Meunissier, E. **Un légume peu connu chez nous: le jet du houblon. [A vegetable little known among us; the young sprouts of the hop.]** Revue Horticole 91: 265–266. Apr., 1919.—Attention is called to the fact that the young spring shoots of the hop may be used as a delicious vegetable. The use of the hop in this way seems to be fairly well established in parts of Belgium, but is scarcely known in France. Brief cultural directions are given. Prepared according to the ordinary methods used for asparagus; hop shoots are equal to that vegetable.—*E. J. Kraus.*

1544. Mottet, S. **Neillia, Physocarpus et Stephanandra.** Revue Horticole 91: 236–238. *Fig. 77.* Feb., 1919.—The article contains a critical discussion of the synonymy, species, and forms of these genera, together with a notation as to their probable value as ornamentals. There is also a brief citation of literature referred to in the discussion.—*E. J. Kraus.*

1545. MOTTET, S. **Picea omorica.** Revue Horticole 91: 269. *Fig. 86.* Apr., 1919.—This species is recommended as a valuable tree for general planting since it is highly ornamental, grows rapidly, and thrives under widely different soil and climatic conditions.—*E. J. Kraus.*

1546. MOTTET, S. **Eryngium giganteum.** Revue Horticole 91: 216–217. *1 pl.* Jan., 1919.—This species is described in some detail and is recommended as being worthy of more extended cultivation as an ornamental, since it is a hardy, biennial, easily propagated by seed and its symmetrical form, and gray-green foliage produce a pleasing contrast with the surrounding plantings. If the whole plants are cut and dried by supporting them base uppermost, they may be used for purposes of interior decoration. Seeds may be obtained from leading seedsmen.—*E. J. Kraus.*

1547. MOTTET, S. **Un nouveau Schizophragma (S. integrifolium).** [**A new Schizophragma.**] Revue Horticole 91: 275–278. *Fig. 87–88.* May, 1919.—This species is a striking ornamental. There are no sterile flowers in the inflorescence, but the latter is showy because of the white, leaf-like bracts which it bears. Because of its hardiness, decidedly superior decorative qualities, and relative ease of propagation it is recommended for general planting. While somewhat similar to *Hydrangea petiolaris*, it is likely to become even more popular in its use. Several distinct varieties of the type are known.—*E. J. Kraus.*

1548. MOTTET, S. **Nouveaux Viburnum de la Chine.** [**New Viburnums from China.**] Revue Horticole 91: 262–264. *1 pl. (colored).* Apr., 1919.—This article presents a list of some twenty species and varieties which are briefly but critically described, more especially as to their proved or potential value as ornamentals.—*E. J. Kraus.*

1549. POISSON, J. **Le Paulownia imperialis au Museum National d'Histoire Naturelle.** Paulownia at the National Museum.] [Paris] Revue Horticole 91: 248–250. *1 pl.* Mar., 1919.—The seeds of this species were brought to France and planted in 1835. The single seedling saved from this sowing is still alive. A reproduction from a recent photograph of it is given. The species is very readily propagated both by seeds and vegetative parts and has been widely distributed. The wood is of some commercial importance, more especially for the making of trinket boxes, ornaments, and other articles not destined for hard usage. The tree grows rapidly and is a desirable ornamental, more especially as a specimen plant.—*E. J. Kraus.*

1550. RITZEMA BOS, J. **De gevolgen van een fout bij het smoeien van laanboomen.** [**The results of an error in pruning shade trees.**] Tijdschr. Plantenz. 24 (Bijblad): 49–51. 1918.—See Bot. Absts. 3, Entry 1655.

1551. ROLET, A. **Entretien du matériel des serres, bâches, coffres.** [**Preservation of greenhouse, hotbed and box materials.**] Revue Horticole 91: 266–267. Apr., 1919.—Because of the high prices and scarcity of many materials used in gardening, it is suggested that special care be taken to prevent deterioration of them. To accomplish this all equipment, etc., should be kept dry when not in use. Such chemicals as copper sulphate, iron sulphate, coal tar derivatives, and acetate of aluminium are recommended as especially valuable for the treatment of equipment made of straw or wood.—*E. J. Kraus.*

1552. RITZEMA BOS, J. **Bijdrage tot de kennis van de werking der bordeauxsche pap op de aardappleplant.** [**A contribution to the knowledge of the action of Bordeaux mixture on the potato plant.**] Tijdschr. Plantenz. 25: 77–94. 1919.—See Bot Absts. 3, Entry 1654.

1553. SCHOEVERS, T. A. C. **Wat nu in den boomgaard gedaan kan worden ter bestrijding van ziekten en plagen.** [**What may now be done in the orchard toward combatting diseases and pests.**] Tijdschr. Plantenz. 25 (Bijblad): 1–4. 1919.—See Bot. Absts. 3, Entry 1658.

1554. Taylor, A. D. **Seasons for planting ornamental plants and lawns.** Landscape Architecture 9: 141–149. *Fig. 1–2.* 1919.—Dormant periods of plants and times for seeding lawns are discussed under the following heads: (a) deciduous trees, shrubs and vines; (b) evergreen plants (coniferous and broad-leafed); (c) herbaceous perennials; (d) lawn grasses. Reference is made to Bull. No. 10, U. S. Dept. Agric. Div. Biol. Sur., "Life Zones and Crop Zones," Part III. From data taken from this bulletin and at seventeen stations mostly in the eastern half of the United States several zones are determined based upon growing seasons. These are found to depend upon topographical and meterological conditions rather than upon lattitude and so are irregular in outline and best explained by a map (fig. 1). The planting periods for northern New England and northern Great Lakes sections include 70 to 80 days, for the great central portion of the country 100 days, for the southern which is above the tropical portions 115 to 160 days. The east and west slopes of the Rocky Mountains and west coast are not fully reported on. Data secured refers mostly to heading (a) although this is thought to apply similarly to conifers if condition of soil moisture is sufficient in ground from which they are taken and in which they are planted at time of freezing. Data for broad-leaved evergreens are reported as insufficient. The planting periods for herbaceous perennials will begin later in spring and end earlier in fall. The periods for lawn-making would in most cases be earlier, depending upon the advent of hot dry weather and the return of cooler and more moist conditions. A chart (fig. 2) gives detailed information of planting periods for woody deciduous plants and for lawn seeding at the following stations: Camden, Maine; Boston; Buffalo; Minneapolis; Toronto; Cleveland; Kansas City; Trenton, New Jersey; Cincinnati; Piedmont, Georgia; Carolina; Virginia coastal plain; Portland, Oregon; Sacramento; Jacksonville, Florida; Florida highlands; San Francisco.—*E. Gorton Davis.*

1555. Tokugawa, Yoshichika. **Kaki no dasshi ni tsuite. On the de-astringency in the fruit of Diospyros Kaki.** [Title in Japanese and English, text in Japanese.] Bot. Mag. Tôkyô 33: 41–44. Mar., 1919.—See Bot. Absts. 3, Entry 2881.

1556. Trouard-Riolle, Y. **Radis sauvages et radis cultivés. [Wild and cultivated radishes.]** Revue Horticole 91: 244–245. *Fig. 78–81.* Mar., 1919.—The possible origin of the radish from the charlock is discussed. The radish-like plants secured when the charlock is cultivated are in reality hybrids between that species and the radish. Several facts which indicate the accuracy of such a conclusion are: (1) If cross pollination is prevented, it is impossible to secure a transformation of the charlock in four generations. (2) If cross pollination is permitted, radish-like forms may be obtained in the first generation. (3) Such forms are intermediate in character, possess both fertile and sterile pollen grains, and produce a mixed progeny. (4) By controlled crossing radish-like progeny similar in form and behavior are obtained. (5) By preventing cross pollination the radish does not degenerate in several generations, but does so readily if permitted to cross, and in two years it is possible to recover the charlock from one hybrid seed of the radish. Once more it is recalled that it is difficult actually to trace the evolution of any form. The evolutionary hypothesis itself is called into question.—*E. J. Kraus.*

1557. Van den Heede, Ad. **Les Cuphea.** Revue Horticole 91: 218. Jan., 1919.—A more generous planting of several species of this genus, especially *Cuphea platycentra* and *C. ignea*, is recommended. The plants are propagated either from seeds or cuttings started in the greenhouse and are transplanted to the open ground in May.—*E. J. Kraus.*

1558. Van den Heede, A. **Les conifères dans les jardins. [Conifers in gardens.]** Revue Horticole 91: 279. May, 1919.—The fact is deprecated that conifers are generally regarded as more nearly fitted for cemetery planting than for more general use in parks and gardens. An urgent appeal is made for a more general appreciation of the common as well as the more unusual forms.—*E. J. Kraus.*

1559. VIAUD-BRUANT. **Nouveaux Chrysanthèmes. [New Chrysanthemums.]** Revue Horticole 91: 213–216. *Fig. 69–71.* Jan., 1919.—The following varieties are listed and briefly described. Maud Pellet—early, bronze; Gustave Pellet—clear amber; La Paix—stocky plant, floriferous, fine rose; Maréchal Foch—large flowered, bright rose with silvery reflections; Louis Legrand—large flowered, crimson purple; Maréchal Pétain—nasturtium red, suffused with a very warm tone; Le Tigre—stocky compact plant, carmine purple, variegated white at base; La Victoire—large flower, incurved, delicate, clear rose, the backs clay saffron, very downy; Hommage au Poilu—large flower, spreading incurved, brilliant yellow, the backs touched with rose, very downy.—*E. J. Kraus.*

1560. VIGUIER, R. **Les Araliacées cultivées. [Cultivated Araliaceae.]** Revue Horticole 91: 228–229. Feb., 1919.—The following genera placed by the author in group 1, having simple leaves, are listed and characterized:—*Hedera* L; *Gilbertia* Ruiz and Pavon; *Fatsia*, Decaisne and Planchon; *Tetrapanax* C. Koch; *Echinopanax* Decaisne and Planchon; *Oreopanax* Decaisne and Planchon; *Kalopanax* Miquel; *Trevesia* Vis; *Meryta* Forster; *Pseudopanax* K. Koch. The article is to be continued. [See also next following Entry, 1561.]—*E. J. Kraus.*

1561. VIGUIER, R. **Les Araliacées cultivées. [Cultivated Araliaceae.]** Revue Horticole 91: 250–252. Mar., 1919.—A continuation of a former article on the same subject (Revue Horticole 91: 228–229. 1919). In the present paper the author presents an analytical key to the several genera and further characterizes in detail the genera of two more groups as follows: (2) Aralias with palmately compound leaves; *Schefflera* Forst; *Dizygotheca* N. E. Brown; *Tupidanthus* Hook. and Thoms; *Acanthopanax* Decaisne and Planchon; *Pseudopanax* K. Koch; *Nothopanax* miq.; *Oreopanax* Decaisne and Planchon; *Cussonia* Thunb.; *Panax* L.; (3) Aralias with pinnately compound leaves; *Polyscias* Forst; *Aralia* L.; *Delaroux* Vieillard. [See also next preceding Entry, 1560.]—*E. J. Kraus.*

1562. WAGNER, J. P. **Les conséquences de la guerre pour l'horticulture en pays neutre. The results of the war upon horticulture in a neutral country.]** Revue Horticole 91: 246–248. Mar., 1919.—The earlier French influences on the horticulture of Luxemburg have been largely replaced by those of German origin because of commercial and geographical limitations. A return to the former is advised and several means by which this may be achieved are suggested.—*E. J. Kraus.*

1563. WHEELWRIGHT, R. A. **Reference table of native ferns.** Landscape Architecture 9: 129–130. *Fig. 1–2.* 1919.—Text consists merely of brief explanation of tables. Two full-page tables list fifty-two species of native ferns, of which both botanical and common names are given and also such characteristics as height, evergreen or deciduous, sun and shade requirements, soil, depth to be planted, spacing and other directions for use in landscape planting.—*E. Gorton Davis.*

HORTICULTURE-PRODUCTS

1564. ALVAREZ, O. P. **Descripción geográfica de la Isla de Formosa. [Descriptive geography of Formosa.]** [Chapt. III, Botany.] Bol. R. Soc. Geogr. Madrid 60: 445–499. 1918. Through abst. by Fragoso, R. Gz., in Bol. R. Soc. Española Hist. Nat. 19: 288. 1919.] [See Bot. Absts. 4, Entry 312.]

1565. BERTRAND, GABRIEL. **Sur les conserves de fruits préparées a froid, sans addition de sucre, d'alcool ni d'antiseptique. [Preservation of fruits without heating.]** Compt. Rend. Acad. Sci. Paris 168: 1162–1164. 1919.—An attempt was made to devise a method for the preservation of fruit without heating and without the addition of sugar or of other preservative. Fruits were washed carefully and sealed in jars in water from which air bubbles had been excluded. The jars of fruit were allowed to stand for almost a year. In certain cases alcoholic fermentation set in but after 11 months 17 cans out of a total of 45 were in perfect

condition, while in other cases only a slight fermentation had resulted. Author concludes that under certain conditions fruit may be preserved without heating and without the addition of preservatives of any sort.—*V. H. Young.*

1566. Müller, B. [Rev. of: Kleberger, Kling and Westphal. **Versuche über Trocknung von Gemüse und Obst.** [**The drying of vegetables and fruits.**] Mitteil. Deutsc. Landw. 1917: 619. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 252–254. 1918.—Directions for drying bean, kohlrabi, cabbage and peas are given, with initial and final temperature, length of time for drying, etc. Special directions are given for withered vegetables.—*F. M. Scherts.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

1567. Alvarado, Salustio. **La fina estructura de los vasos lenosos (Nota previa).** [**Minute structure of wood vessels.**] Bol. R. Soc. Española Hist. Nat. 19: 66–75. *Fig. 1–7.* 1919. Author reviews the growth of knowledge of wood vessels since the time of Henshaw, Malpighi and Grew. Uses the tannin-silver method of Achúcarro-Río Hortega (see Alvarado. Plastosomas y leucoplastos en algunas fanerogamas. Trab. Mus. Nacion. Cien. Nat. Ser. Bot., No. 13. 1918. *p. 9–14*) and prepared material of barley and iris, illustrated in *fig. 1–6*, showing wood vessels with the annular, spiral, or reticulated thickenings. Describes *main wall of trachea as primary membrane, the thickenings as secondary membrane*, both being about equally constituted as to cellulose and lignin. Prepared by above method the secondary membrane (annular, spiral, or reticulated thickenings) stains to show always a very dark axial line surrounded by a fairly clear sheath which in turn is surrounded by an external sheath of an intermediate darkness. In vessels with reticulations very close this structure is difficult to observe, but where meshes are wider they often clearly anastomose, as shown in fig. 4 for barley. Author notes this structure is identical in vessels from root, shoot, leaf, and ovary, and from diverse plants (*Cicer, Phaseolus, Iris*, and *Hordeum*). The three zones are thought not to differ much chemically but to be cellulose more or less condensed or modified by the mixture of other carbohydrates. Resemblance to structure of starch grains similarly prepared is exact (*fig. 7*), and the suggestion of A. Meyer that carbohydrate lamellae and starch-grain layers are alike as to structure and growth is approved by author, who propounds the question as to whether the thickenings are not greatly elongated sphero-crystals of cellulose, much as starch is concerned in the formation of the starch grain. Author notes that (1) with formation of large central vacuole and the location of the protoplasm along the wall of the cell, the protoplasm becomes more granular at point where thickenings are to occur; (2) the chondriomes (the secretory apparatus of the cell) develop considerably in exactly those large vascular cells where thickenings occur; (3) the secondary membrane is a secretion product of the protoplasm. These three phenomena are simultaneous in same cell, and are not the thickenings due to activity of mitochondria which are abundant in cell immediately before the thickenings form. Grains of starch are product of secretion of mitochondria or of their derivatives the plastids, and Dop (1914) has seen the formation of cellulose in interior of chondriosomes. Author concludes that secondary membrane does not form by *local decomposition over cellulose sheath of primary membrane* but rather by growth with reference to the central axis of the thickening as a central nucleus or hilum, and that the external sheath in contact with the primary membrane is the last part to be formed.—*O. E. Jennings.*

1568. De Toni, G. B. **Letture contributo alla teratologia del genera "Chrysanthemum" L.** [**Lecture on teratology in the genus "Chrysanthemum" L.**] Atti R. Accad. Sci. Torino 54: 254–257. 1918–1919.—Three examples of fasciation in *Chrysanthemum carinatum* Schoub. var. *luteum* are given, in which the first shows true synanthy both externally by complete union of the disk flowers surrounded by complete circle of ray flowers, and internally by complete fusion of medullary parenchyma of the head; while the other two are of different types of adhesion in peduncles and heads, showing apparent synanthy in both external and internal characteristics.—*Harriet M. Libby.*

1569. LONGO, B. **Richerche su la poliembrionia. [Studies on polyembryony.]** Ann. Botanica [Roma] 14: 151–162. *1 fig.* Aug. 30, 1917.—Specimens of the ovaries of *Xanthoxylum alatum* Roxb. were examined and compared with the carpels and fruiting parts of X. *Bungei* Planch previously studied by the author. Statistical study of the number of cases of polyembryony occurring shows that this phenomenon is not as common as in the case of the latter plant. The study of the species of *Skimmia* resulted negatively because of the more or less complete abortion of the pistil in these plants. Vegetative regeneration of *Skimmia* sp. growing for a numbers of years, especially as to root development, was observed, though no buds appeared. The plants were found to produce seedless or aborted-seeded fruits without pollination. Rudimentary vivipary of *Skimmia* was demonstrated.—*J. A. Nieuwland.*

1570. MASCRE. **Nouvelles remarques sur le rôle de l'assise nourricière du pollen. [Concerning the function of the tapetum.]** Compt. Rend. Acad. Sci. Paris 168: 1214–1216. 1919.—A brief description of certain features in the development of the tapetum of certain genera of the *Solanaceae* together with notes on the functions and cell content of the cells of the tapetum. The following forms were studied in more or less detail, viz., *Datura arborea* L., *D. Stramonium* L., *D. Tatula* L., *Solanum Dulcamara* L., *Atropa Belladonna* L., *Nicandra physaloides* Gaertn., and *Solanum tuberosum* L. Other genera mentioned are *Hyoscyamus, Nicotiana, Lycium, Digitalis, Anchusa* and *Symphytum.*—*V. H. Young.*

1571. MOTTET, S. **Pomme de terre gigogne. [A monstrous potato.]** Revue Horticole 91: 255–256. *Fig. 83.* Mar., 1919.—A monstrous form of the potato in which eight small tubers are clustered at the end of a large one, is described. Two other specimens, one the form of a duck and the other the form of a hand, are cited as having been previously listed.—*E. J. Kraus.*

1572. NAKAJIMA, YÔZÔ. **Midzu-ohbako no kwajitsu no hôwai genshô ni tsuite. Über das Verbreitungsmittel der Samen von Ottelia alismoides Pers. [On the method of seed distribution of Ottelia alismoides Pers.]** [Title in Japanese and German, text in Japanese.] Bot. Mag. Tôkyô 33: 44–52. March, 1919.—See Bot. Absts. 4, Entry 249.

1573. [NORSTEDT, C. T. O.] [Swedish rev. of: HARMS, U. **Über die Geschlechtvertheilung bei Drya octopetala L. nach Beobachtungen in Kgl. Botanischen Garten Berlin-Dahlem. (Concerning sex ratios in Drya octopetala.)** Ber. Deutsch. Bot. Ges. 36: 292–300. *Fig. 5–10.* 1918.] Bot. Notiser 1918: 247. 1918.

1574. SCHAFFNER, JOHN H. **Unusual dichotomous branching in Vernonia.** Ohio Jour. Sci. 19: 487–490. 1919.—At Emporia and Meriden, Kansas, dichotomy in the stems of *Vernonia baldwinii* Torr. was found to be of wide distribution and abundant occurrence. Fasciation was relatively rare. The dichotomy is considered as a case of ever-sporting or recurrent variation.—*H. D. Hooker, Jr.*

1575. SCHAFFNER, JOHN H. **The nature of the dioecious condition in Morus alba and Salix amygdaloides.** Ohio Jour. Sci. 19: 409–416. 1919.—Of 66 *Morus alba* trees examined, 28 were found to be carpellate, 24 staminate and 14 intermediate. Detailed descriptions are given of the intermediates. One individual showed sex reversal in the vegetative tissues of the bud. It is concluded that sex reversal is probably due to a change in the physiological state of the tissues, and that this might be most readily accomplished in the zygote. Of 100 *Salix amygdaloides* trees, 9 intermediates were found, showing catkins with staminate flowers below and carpellate flowers at the tip. At the transition zone, abnormal flowers were frequent. Sexuality is considered to be quantitative; not a Mendelian character but a physiological condition. The life cycle of *Selaginella kraussiana* is cited in substantiation.—*H. D. Hooker, Jr.*

1576. SIMBO, IPPO. **Hompo-san nisan no chûei ni kwansuru kenkyû. Beiträge zur Kenntnis einiger einheimischen Pflanzengallen im Japan. [Studies on some plant-galls in Japan.]** [Title in Japanese and German, text in Japanese.] Bot. Mag. Tôkyô 33: 1–12. Jan., 1919.—See Bot. Absts. 3, Entry 2895.

MORPHOLOGY AND TAXONOMY OF ALGAE

J. R. Schramm, *Editor*

1577. Anonymous. **A new kelp project at San Diego.** Pacific Fisherman 17: 58. 1919. —A note on the organization of a new company to manufacture chemicals from kelps.—*T. C. Frye.*

1578. Delsman, H. C. **The egg-cleavage of Volvox globator and its relation to the movement of the adult form and to the cleavage types of Metazoa.** Proc. Roy. Acad. Sci. Amsterdam 21: 243–251. 1918. [Transl. from Versl. K. Akad. Wetensch. Amsterdam, 1918.]—A study of the egg-cleaves of *Volvox globator* shows that the process does not correspond to the spiral type in the form in which it occurs in Metazoa. It is suggested that the dexiotropic rotation of the *Volvox* colony results from the dexiotropic torsion of the egg cells during cleavage, the main axis of the cells undergoing a slight deviation. The torsion during egg-cleavage is regarded merely as "a very precociously appearing character of the adult form related to the movement of the latter."—*F. B. Wann.*

1579. Gloess, Paul. **Les plantes marines. Leurs utilisations. [Utilization of marine plants.]** Bull. Inst. Oceanograph. Monaco 350. *80 p.* 1919.—A statement of the present treatment of marine plants in the derivation of useful products from them, and the uses of these plants chiefly from the manufacturing and chemical points of view. The groups considered are the red and the brown algae, and *Zostera* and species related to it. About a fourth of the article is devoted to the properties, treatment and uses of algin and the alginates. —*T. C. Frye.*

1580. Groves, James. **Tolypella glomerata Leonh. in the Isle of Wight.** Jour. Botany 57: 197. 1919. Note on occurrence. This is apparently the first record of a species of *Tolypella* on the island.—*K. M. Wiegand.*

1581. Hirsch, Erwin. [Rev. of: Pascher, A. **Flagellaten und Rhizopoden in ihren gegenseitigen Beziehungen. Versuch einer Ableitung der Rhizopoden. (Flagellates and Rhizopods and their relations.)** Arch. Protistenk. 38: 1–88 *Fig. 1–65.* 1917.] Naturwiss. 7: 74–75. 1919.

1582. Sauvageau, C. **Sur la dissémination et la naturalization de quelques algues marines. [Dispersion and acclimatization of marine algae.]** Bull. Inst. Oceanograph. Monaco 342. *28 p.* 1918.—The motility of the reproductive cells is an inconsiderable factor in dispersion, in comparison with currents; the red algae are therefore not at any material disadvantage on account of their non-motile sperms and spores. Extension of range is largely by means of reproducing fragments carried by currents. Shore algae may be carried through attachment to floating supports, among which may be ships. When pieces of algae are transported to situations unsuitable for reproduction the species may maintain itself vegetatively for years.—*T. C. Frye.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

1583. Evans, Alexander W. **Noteworthy Lejeuneae from Florida.** Amer. Jour. Bot. 5: 131–150. *Fig. 1–5.* 1918.—Six additions to the Lejeuneae of Florida, all collected by S. Rapp in the vicinity of Sanford, are recorded, the total number now known from the state being 44. The additions include *Lejeunea longifissa* Steph., previously known from Cuba. *Rectolejeunea Maconii* Evans, previously known from Jamaica only but now known also from Alabama and Porto Rico, and the following species proposed as new: *Cololejeunea contractiloba, Lejeunea cladogyna, Euosmolejeunea parvula* and *Ptychocoleus heterophyllus.* Of these new species *Lejeunea cladogyna* occurs also in Porto Rico and *Ptychocoleus heterophyllus,*

in Honduras; the remaining two, according to our present knowledge, are confined to Florida. The peculiarities of the species noted are discussed and the new species are described in detail. In the case of *Ptychocoleus heterophyllus* vegetative reproduction by means of modified caducous leaves, borne on branches of limited growth, is reported. The figures illustrate *Lejeunea longifissa* and the 4 new species.—*Alexander W. Evans.*

1584. FLETCHER, GEORGE. **Red Cross work at the Royal College of Science.** Jour. Dept. Agric. Ireland 19: 322–326. 1919.—See Bot. Absts. 3, Entry 1671.

1585. GERTZ, OTTO. **Anomalier i groddknopparnes byggnad hos Lunularia cruciata L.** [**Anomalies in the structure of the gemmae in Lunularia cruciata.**] [Swedish with German resumé.] Bot. Notiser 1918: 231–234. *9 fig.* 1918.—The anomalies appeared mostly as a result of supernumerary growing points. The gemmae often acquire a rounded-triangular form with three growing points, one apical and two lateral, one on each side near the base. Sometimes the apical growing point is lacking and two are present on one or both sides. In one case a gemma was divided into halves, which curved at right angles to each other; when placed in water for culture, one of the halves assumed a vertical position and formed rhizoids on both surfaces.—*P. A. Rydberg.*

1586. PEARSON, WM. HENRY. **Hepatics of Denbighshire.** Naturalist 1918: 66–67. 1918. —About a dozen species are mentioned, and notes on distribution are given in considerable detail. *Haplozia pumila* is recorded from the county for the first time.—*Alexander W. Evans.*

1587. PEARSON, WILLIAM HENRY. **Notes on Radnorshire hepatics.** Jour. Botany 57: 193–195. 1919.—The paper is based on a collection made by Mr. Harry Bendorf at Aberedw, in April, 1919. Forty-three species were identified, as compared with nineteen previously listed from the country. Critical notes are given on several species, and a list of novelties is included. Among the latter the following are especially noteworthy: *Lejeunea cavifolia* (Ehrh.) Lindb., var. *heterophylla* Carr., *Lophocolea spicata* Tayl. and *Riccia Crozalsii* Lev. The first of these is provisionally raised to specific rank under the name *Lejeunea heterophylla* (Carr.) Pears.—*K. M. Wiegand.*

1588. PEARSON, WM. HENRY. **Hepatics of the Hebden Bridge Valley.** Naturalist 1918: 123–124. 1918.—The results of a collecting trip made in September, 1917, are reported. Among the more interesting species found are the following: *Nardia geoscypha, Scapania umbrosa, S. curta, Lophozia atlantica* and *Jubula Hutchinsiae.*—*Alexander W. Evans.*

1589. SCHIFFNER, V. **Hepaticae Baumgartnerianae dalmaticae. III Serie.** [**Baumgartner's Dalmatian Hepaticae. Third Series.**] Oesterr. Bot. Zeitschr. 67: 147–156. *19 fig.* 1918.—The region treated—the Zaratiner—embraces the Dalmatian coast from Nona to Zaravecchia, together with the neighboring islands. The ground is for the most part low and covered over with evergreen shrubs. Twenty-seven species of Hepaticae are enumerated with citations of specimens, ten belonging to the Marchantiales and seventeen to the Jungermanniales. *Riccardia multifida* (L.) S. F. Gray is recorded for the first time from Dalmatia and the following varieties are described as new: *Riccia subbifurca* Warnst., var. *inversa* Schiffn., and *Fossombronia caespitiformis* De Not., var. *multispira* Schiffn. The figures illustrate *Riccia Henriquesii* Lev. and *R. subbifurca*, vars. *eutricha* Schiffn. and *inversa.*—*Alexander W. Evans.*

MORPHOLOGY AND TAXONOMY OF FUNGI

E. W. OLIVE, *Editor*

1590. FRAGOSO, R. GZ. [**Microtechnique of the Fungi.**] [Rev. of: MOREAU, F. **Notions de technique microscopique.—Application à l'étude des champignons.** Bull. Soc. Mycol. France 34: 137–191. *55 fig.* 1918.] Bol. R. Soc. Española Hist. Nat. 19: 288. 1919.—A compendium for those beginning the study of mycology.—*O. E. Jennings.*

1591. Fragoso, Romualdo Gonzáles. **La "antracnosis" o "rabia" del guisante." (Ascochyta Pisi Lib.)** [**Anthracnose or rabies of peas.**] Bol. R. Soc. Española Hist. Nat. 19: 189–196. *Pl. 5 (colored), fig. 1–3.* 1919.—See Bot. Absts. 3, Entry 1637.

1592. Pethybridge, George H. **A destructive disease of seedling trees of Thuja gigantea Nutt.** Quart. Jour. Forest 13: 93–97. 1919.—See Bot. Absts. 3, Entry 1652.

1593. Taubenhaus, J. J. **Pink root of onions.** Science 49: 217–218. Feb., 1919.—See Bot. Absts. 3, Entry 1653.

1594. Turconi, M. **Un nuovo parassita dei peperoni (Acrothecium Capsici n. sp.).** [**A new parasite of pepper.**] Revist. Patol. Veg. 9: 131–133. 1919.—See Bot. Absts. 3, Entry 1665.

1595. van der Lek, H. A. A. **Over de z. g. "verwelkingsziekten," in het bijzonder die, welke door Verticillium alboatrum veroorazzkt worden.** [**Regarding the so called wilt diseases, especially those caused by Verticillium alboatrum.**] Tijdschr. Plantenz. 24: 205–219. *Pl. 4, fig. 1–3.* 1918. *Ibid.* 25: 17–52. *Pl. 1–3, fig. 1–4.* 1919.—See Bot. Absts. 3, Entry 1666.

1596. Wolf, F. A., and R. O. Cromwell. **Clover stem rot.** North Carolina Agric. Exp. Sta. Tech. Bull. 16. *18 p., Pl. 1–15.* 1919.—See Bot. Absts. 3, Entry 1669.

PALEOBOTANY AND EVOLUTIONARY HISTORY

Edward W. Berry, *Editor*

1597. Bassler, H. **A sporangiophoric Lepidophyte from the Carboniferous.** Bot. Gaz. 68: 73–108. *Pl. 9–11.* 1919.—Describes fructifications which were apparently those of certain species of *Lepidodendron* and shows that these depart rather widely from the well known *Lepidostrobus* type in that the sporophylls comprise stalk and blade and a large adaxial lamellar sporangiophore which bears two large radially elongated sporangia, the whole being normally shed at maturity, since in no cases is the cone axis preserved. For these sporangiophoric Lepidophytes the new genus Cantheliophorus is proposed, and since they seem to be of great stratigraphic importance, 12 species are discriminated, of which seven are new. The material comes from Maryland, Kansas, Pennsylvania, Scotland, Silesia and Spitzbergen.

Environmental and phylogenetic considerations are fully discussed and the author concludes that the simple relation of the Lycopod sporangium to the sporophyll is a reduction from sporangiophoric ancestors and that the sterile plates of several species of *Lepidostrobus* and the sterile tissue in *Spencerites* and *Mazocarpon*, while favorable to nutrition, are not developed as a result of progressive sterilization but are remnants of the sporangiophore present in the ancestral lepidophytes. The discovery of *Cantheliophorus* goes a long way to substantiate this contention and the consequent relationship between the Lepidophyta and the Sphenophyllae and Calamariae.—*E. W. Berry.*

1598. Berry, E. W. **The Upper Cretaceous Mississippi Gulf.** Sci. Monthly 9: 131–144. *Fig. 1–6.* 1919.—During Triassic, Jurassic and Comanchean (Lower Cretaceous) times southeastern United States was above sea. This land was the scene of the culmination and final extinction of Pteridosperms, ferns, calamites, lepidodendrons and sigillarias that had characterized the coal measures; of the differentiation of the Triassic floras; and of the expansion and wane of cycadophytes of the Jurassic and Comanchean. It witnessed the origin and differentiation of Angiosperms.—The age of mammals in Tertiary times was made possible, as was the development of man beyond the hunting stage, by the fruits and seeds of flowering plants.—The early Upper Cretaceous is a time of surpassing interest to the student of by-gone floras. The Tuscaloosa has the most extensive flora of any of the Cretaceous formations of the Mississippi embayment. It comprises over 150 species, none of which are known in the Eocene of this region. Of the 87 genera, representing 48 families

and 31 orders, over half are now extinct, while others are only found in South America, the orient or the antipodes.—The largest alliances are Ranales with 26 species, Rosales with 15 species, Sapindales with 15 species, Coniferales with 14 species and Urticales with 8 species. One hundred and twenty-three are dicotyledons, only 16 of which belong to the gamopetalous division. Among the conifers are *Sequoia*, *Dammara*, *Protodammara* and *Widdringtonites*. Figures show leaves of *Devalquea*, *Manihotites* and 4 *Bauhinias*.—*L. Page.*

1599. BERRY, EDWARD W. **Eucalyptus never present in North America.** Science 49: 91–92. Jan., 1919.—The author believes that the identification of *Eucalyptus* in many fossil floras has led to erroneous conclusions in the minds of many geologists and botanists. The theory of origin and distribution for the family Myrtaceae, advanced by him a few years ago, considered America as the center of radiation for the family, and regarded the subfamily Myrtoideae as the most ancient. The subfamily Leptospermoideae was regarded as derived from the former, and Australian types which are the peculiar ones of the family, were regarded as having originated in that region in response to local environmental conditions subsequent to the cretaceous radiation of the family stock. Genera such as *Eugenia* and *Myrcia* were regarded as representing this ancestral stock more nearly than any other of the existing genera. *Eucalyptus* was considered as one of the more specialized genera. The author does not regard the genus *Eucalyptus* as ever having been present in fossil forms in North America. He advocates the dropping altogether of the use of *Eucalyptus* for the numerous North American Cretaceous forms, and the taking up of the genus *Myrtophyllum* and using it for leaves of Myrtaceae whose generic relations cannot be determined with certainty, and more especially for the leaves commonly referred to the genus *Eucalyptus*.—*A. H. Chivers.*

1600. BERRY, E. W. **Upper Cretaceous floras of the Eastern Gulf region in Tennessee, Mississippi, Alabama and Georgia.** U. S. Geol. Surv. Prof. Paper 112. *178 p., 35 pls. 18 fig.* 1919.—A monographic account of the geology and fossil floras of the earliest Upper Cretaceous sediments of the eastern shores of the Mississippi embayment. The oldest formation recognized, namely the Tuscaloosa, contains 151 species of plants, referred to genera of which 50 per cent are extinct at the present time. Of special interest are the Coniferophyta represented by the genera *Pinus*, *Dammara*, *Sequoia*, *Androvettia*, *Protophyllocladus*, *Brachyphyllum*, *Protodammara*, *Geinitzia*, *Abietites* and *Widdringtonites*. There are 123 species of Dicotyls in the flora, 107 of these are Choripetalae and 16 Gamopetalae. New species are described in *Sphaerites*, *Lycopodites*, *Cladophlebis*, *Piperites*, *Ficus*, *Platanus*, *Cuculus*, *Menispermites*, *Capparites*, *Cassia*, *Leguminosites*, *Celastrophyllum*, *Sapindus*, *Greviopsis*, *Oreodaphne*, *Malapoenna*, *Conocarpites*, *Aralia*, *Sapotacites*, *Calycites*, *Carpolithus and Phyllites*.—Overlying the Tuscaloosa formation are marine beds referred to the Eutaw formation and correlated with the Turonian stage of Europe. These have furnished 41 species of plants of which the commonest is a well marked species of *Araucaria*. Still younger beds are referred to the Ripley formation which is correlated with the Emscherian stage of Europe. These beds have furnished 21 species of plants. The book is profusely illustrated and contains complete tables of distribution.—*E. W. Berry.*

1601. BERRY, E. W. **A new Matonidium from Colorado, with remarks on the distribution of the Matoniaceae.** Bull. Torrey Bot. Club 46: 285–294. *Fig. 2, pl. 12, 13.* 1919.—Fully describes and illustrates a species of *Matonidium* from the Cretaceous of southwestern Colorado. The second part of the paper discusses the former cosmopolitanism of the Matoniaceae and plots the known occurrences of both existing and fossil species on a world map.—*E. W. Berry.*

1602. BERRY, E. W. **Article Paleobotany.** Encyclopedia Americana 21: 140–170. *5 fig.* 1919.—General account of the history and present status of the science. The various plant phylae are discussed, the so-called vascular plants being segregated into the following great groups: Pteridophyta (restricted to the Filicales): Arthrophyta, comprising the modern Equisetales and the extinct Sphenophyllae and Calamariae: Lepidophyta, comprising the orders Lepododendrales, Lycopodiales, Isoetales and Psilotales: Pteridospermophyta or

seed ferns: Cycadophyta or cycads and their extinct relatives: Coniferophyta, which correspond almost precisely with the Gymnospermae of the older students: and Angiospermophyta which comprises the so-called flowering plants.—*E. W. Berry.*

1603. Berry, E. W. **Geologic history of the locust and its allies.** Plant World 21: 284–298. *26 fig.* 1919.—A popular account of the geological history and former distribution of the genera *Robinia, Gleditsia, Gymnocladus* and *Cercis* illustrated with numerous figures of fossil forms.—*E. W. Berry.*

1604. Berry, E. W. **Paleogeographic significance of the Cenozoic floras of equatorial America and the adjacent regions.** Geol. Soc. Amer. Bull. 29: 631–636. (1918) 1919.—Summarizes our knowledge of the Tertiary floras of South America and southern North America, concluding that the Mesozoic and early Tertiary radiation of the flowering plants was from the Northern Hemisphere over well defined land connections with South America, and that there was a free interchange of forms in the Oligocene, Miocene and Pleistocene.—*E. W. Berry.*

1605. Berry, E. W. **Age of certain plantbearing beds and associated, marine formations in South America.** Geol. Soc. Amer. Bull. 29: 637–648. (1918) 1919.—Summarizes existing knowledge of the Tertiary floras of Panama, Colombia, Ecuador, Peru and Chile and proposes tentative correlations of these with marine formations in this general region and also with Patagonia and Antarctica, discussing their bearing on the geological history of the western part of the continent.—*E. W. Berry.*

1606. Berry, E. W. **Miocene fossil plants from northern Peru.** Proc. U. S. Nation. Mus. 55: 279–294. *Pl. 14–17.* 1919.—Describes the geology and fossil flora found in the coastal region of northern Peru south of Tumbez. The following plants are described from beds of early Miocene, probably Burdigalian, age: *Iriartites tumbezensis* n. gen. et sp., *Stenospermation columbiense* Engelhardt, *Bambusium Stübeli* Engel., *Ficus Winslowiana* n. sp., *Guatteria culebrensis* Berry, *Amona Winslowiana* n. sp., *Banisteria incerta* n. sp., *Trigonia variana* Engel., *Vochysia retusifolia* Engel., *Tapirira lanceolata* Engel., *Mespilodaphne tumbezensis* n. sp., *Persea macrophylloides* Engel., *Styrax lanceolata* Engel., *Condaminea grandifolia* Engel. It is shown that in early Miocene times a tropical mesophytic flora occupied the present coastal desert region, from which it is concluded that the Andes had not been elevated at that time or that the Humboldt current did not occupy its present position.—*E. W. Berry.*

1607. Berry, E. W. **An Eocene flora from trans-Pecos Texas.** U. S. Geol. Surv. Prof. Paper 125: 1–9. *8 fig., pl. 1–13.* 1919.—Describes a basal Eocene flora from the Barilla Mountains in western Texas. Species described are *Sabalites grayanus* (Lesq) Berry, *Gronomites visianii* n. sp., *Juglans rugosa* Lesq., *Asimina eocenica* Lesq., *Ilex barillensis* n. sp., and *Oreodaphne pseudoguianensis* Berry.—*E. W. Berry.*

1608. Campbell, D. H. **The derivation of the flora of Hawaii.** *34 p.* Stanford Univ., California. 1919.—An extended discussion of the regional relationships of the Hawaiian flora and summary of the faunal evidence of all the great groups so far as known. The author concludes that the liverworts and filmy ferns afford especially conclusive evidence, which is supported in a greater or less degree by evidence derived from other plant groups and the fauna, that the bulk of the Hawaiian flora was derived from the South Pacific region, and that this derivation cannot be satisfactorily explained except by the assumption of a more or less direct land connection in former geologic times.—*E. W. Berry.*

1609. Carpentier, A. **Notes d'excursions paléobotaniques à Chalonnes et Montjean (Maine-et-Loire).** [**Notes of paleobotanical excursions to Chalonnes and Montjean.**] Compt. rend. somm. Soc. geol. France 11: 118–119. 1919.—Records *Psilophyton, Lepidodendron, Rhodea Archaeopteris, Calymmatotheca, Telangium* and *Zeilleria* from the Lower Carboniferous of France.—*E. W. Berry.*

1610. HOWE, M. A. **Tertiary calcareous Algae from the islands of St. Bartholomew, Antigua and Anguilla.** Carnegie Inst. Washington [D. C.] Publ. 291: 9–19. *Pl. 1–6.* 1919.—Records *Lithoporella melobesioides* Foslie, a recent species of the Maldives and found fossil in New Guinea, from the upper Oligocene Anguilla formation of Anguilla, from the middle Oligocene of Antigua, and from the upper Eocene or lower Oligocene of St. Bartholomew. Describes the following new species: *Archæolithamnium affine*, *Lithothamnium concretum* and *Lithophyllum ? molare* from the middle Oligocene of Antigua; and *Lithophyllum homocomium* from the upper Eocene or lower Oligocene of St. Bartholomew.—*E. W. Berry.*

1611. KIDSTON, R., AND W. H. LANG. **On Old Red Sandstone plants showing structure from the Rhynie Chert Bed, Aberdeenshire. Pt. I. Rhynia Gynne-Vaughani.** Trans. Roy. Soc. Edinborough 51: 761–784. *1 pl.* 1917.—Describes morphology of the oldest land plant whose structure is at all completely known. *Rhynia* comes from a chert band in the Devonian of Scotland, the chert representing silicified beds of peat, made up almost entirely of the prostrate stems and rhizomes of *Rhynia*. *Rhynia* was leafless and rootless and consisted of a branched underground rhizome attached to the soil by rhizoids, bearing slender forked leafless erect branches about 8 inches high. The reproductive organs are represented by large homosporous cylindrical sporangia at the end of stout stalks which the authors interpret as terminal portion of the main stem rather than of a special branch. Comparisons are instituted with the Devonian *Psilophyton* and with the recent Psilotales and the authors propose a new class—the Psilotales for *Rhynia* and *Psilophyton*, diagnosed by the sporangia being at ends of certain branches of the stem without any relation to leaves or leaflike organs. —*E. W. Berry.*

1612. KNOWLTON, F. H. **Relations between the Mesozoic floras of North and South America.** Geol. Soc. Amer. Bull. 29: 607–614. (1918) 1919.—Author discusses the known Triassic, Jurassic and Cretaceous floras from the two continents and concludes that there is little demonstrable relationship between the Triassic and Jurassic floras largely because of lack of knowledge of these floras in the greater part of the area, and that there is direct and strong evidence of land connection in what is known of the flora of mid Cretaceous or early Upper Cretaceous times.—*E. W. Berry.*

1613. NATHORST, A. G. **Ginkgo adiantoides (Unger) Heer im Tertiar Spitzbergens nebst einer kurzen übersicht der ubrigen fossilen Ginkgophyten desselben landes.** [**Ginkgo adiantoides dominant in the Tertiary of Spitzbergen, and a brief review of related Spitzbergen fossils.**] Geol. Fören. Forhandl. 41: 234–248. *fig. 4.* 1919.—Describes and figures *Ginkgo adiantoides* from Spitzbergen and supposedly related remains referred to the genera *Baiera*, *C'zekanowskia*, *Phoenicopsis*, and *Feildenka* (or *Torellia*, as Nathorst shows it should be called). —*E. W. Berry.*

1614. RENIER, A. **Quelques nouveaux echantillons de végétaux à structure conservée du Westphalien de la Belgique.** [**New plant types from structures preserved in the Westphalian of Belgium.**] Soc. geol. Belg. Ann. 41: B332–236. 1919.—Records specimens of *Lepidodendron*, *Trigonocarpus*, *Lepidostrobus*, *Medullosa*, *Mesoxylon* and *Stigmaria* with more or less structure preserved, in calcareous nodules in the Carboniferous marine shales of the Belgian Coal Measures.—*E. W. Berry.*

1615. SEWARD, A. C. **Recent Paleobotany in Great Britain.** Science 50: 43–48. 1919.—A succinct account of British contributions to our knowledge of fossil plants during the past five years.—*E. W. Berry.*

1616. TRELEASE, WM. **Bearing of the distribution of the existing flora of Central America and the Antilles on former land connections.** Geol. Soc. Amer. Bull. 29: 649–656. (1918) 1919.—Describes the botanical break between the floras of the Greater and Lesser Antilles. A number of plant groups are discussed in some detail, namely, the oaks (*Quercus*), Nolineæ, Yucceæ, Phoradendron, *Furcæa* and *Agave*. Author concludes that the oaks afford no

evidence of land connections with North America, that the Nolineae and Yuccoeae indicate absence of any continental land connection, that *Phoradendron* and *Furcraea* suggest a former land connection with North and South America, and that *Agave* furnishes strong proof of a successively fragmented Antillean land bridge connecting with Central America in the Yucatan region.—*E. W. Berry.*

1617. Walkom, A. B. **The Floras of the Burrum and Styx River Series [Mesozoic Floras of Queensland. Parts 3 and 4.]** Queensland Geol. Surv. Publ. 263. *76 p., 7 pl.* 1919.—Author records 36 species of plants from the Burrum series of Queensland, concluding that the age is Lower Cretaceous. Several of the more interesting forms are figured and new species are described in *Sphenopteris, Phyllopteris, Microphyllopteris, Zamites, Taeniopteris* and *Araucarites*. The North American genus *Nageiopsis* is tentatively recognized from these beds. The Styx series contains but 14 species but is of great interest since among an assemblage of old types characteristic of the Burrum series it contains a considerable number of dicotyledonous types some of which are referred to the form genus *Celastrophyllum* which is so common in the Albian and Cenomanian rocks of North America.—*E. W. Berry.*

1618. Walkom, A. B. **On a collection of Jurassic plants from Bexhill, near Lismore, N. S. W.** Proc. Linn. Soc. New South Wales 44: 180–190. *Pl. 7, 8.* 1919.—Author describes and figures *Comopteris hymenophylloides* var. *australica, Cladophlebis australis, Microphyllopteris pectinata, Cycadites* sp., *Taeniopteris spatulata, Araucarites cutchensis* and *A. gracilis* from beds belonging to the Clarence Series and of Jurassic age.—*E. W. Berry.*

1619. Walkom, A. B. **Queensland fossil floras.** Proc. Roy. Soc. Queensland 31: 1–20. *Fig. 1–5.* 1919. Presidential address, containing a summary of our knowledge of the fossil floras of Queensland. These include Paleozoic, Triassic, Jurassic, Cretaceous and Tertiary floras. Chief emphasis is given to the Mesozoic floras, which are well represented in Queensland and have been the subject of special study by the author.—*E. W. Berry.*

1620. Wieland, G. R. **Classification of the Cycadophyta.** Amer. Jour. Sci. 47: 391–406. 1919.—Abstract of the history of classification of this ancient phylum, and a presentation of the authors present opinions on the relationships, geological history and classification of the cycad-like plants, illustrated by diagrams.—*E. W. Berry.*

1621. Wieland, G. R. **The needs of paleobotany.** Science 50: 68–69. 1919.

PATHOLOGY

Donald Reddick, *Editor*

1622. Anonymous. **Regulation, etc., fungicides act.** Jour. Dept. Agric. Victoria 16: 51–52. 1918.

1623. Appel, Otto. **Was lehrt uns der Kartoffelbau in den Vereinigten Staaten von Nord Amerika. [What potato culture in U. S. A. teaches us.]** Arb. Gesell. Förd. Baues wirts. zweckm. Verw. Kart. 17. *68 p., 20 fig.* Berlin, 1918.—General account of the climatic and other conditions under which potatoes are grown in U. S. A., description of methods employed in potato culture, an account of investigative work in progress, review of regulatory measures enforced, and an enumeration, with notes, of the insects and diseases of potatoes. American literature is noted in bibliographical footnotes.—*D. Reddick.*

1624. Ballou, H. A. **Chinch bug fungus.** Agric. News [Barbados] 18: 154. 1919.—Record of *Sporotrichum globuliferum* parasitising cotton stainers [Dysdercus spp.] in Antigua. Author thinks a trial of the artificial spread of the fungus is worth making, but judging from results of similar trials elsewhere warns against expecting too much.—*J. S. Dash.*

1625. BARSS, H. P. **Prune troubles of non-parasitic nature.** Better Fruit 13¹: 7–8, 24–26. 1919.—Address delivered before Oregon State Horticultural Society, Roseburg, Dec. 7, 1918.—Effects of the extraordinary climatic conditions in Western Oregon in 1918 upon the fruit of plums (prunes) is considered in a popular way. The following nonparasitic diseases or physiological disturbances are discussed at length: (1) "Gum spot" or formation of spots of a gummy substance either within or on the outside of green fruits. Affected fruit becomes irregular in shape and finally turns dark. Differences between the demand and supply of water during the critical time of the growing season is thought to be the cause of this disturbance. (2) Internal browning, another non-parasitic disease, is briefly considered. Sudden supply of moisture after a prolonged drought is mentioned as a possible cause. Conservation of the moisture supply in soil during the time of greatest demand of the tree is suggested as the most feasible remedy of the above non-parasitic diseases.—*A. E. Murneek.*

1626. BOYD, J. **Nectria cinnabarina as a parasite.** Quart. Jour. Forest. 13: 139. 1919.—In pruning young sycamores and elms in a plantation, every wound on all trees, with the exception of those on a few acres, was coated with coal tar. On the small section referred to the wounds were treated with oil paint. In no single instance, was there an attack by *Nectria* on a tree which had tar applied to the wound. Where paint was used, 90 per cent of the trees were affected and about 20 per cent killed.—*C. R. Tillotson.*

1627. BÜSGEN, M. **Biologische Studien mit Botrytis cinerea.** [Biological studies with Botrytis cinerea.] Flora 111–112: 606–620. 1918.—In spite of numerous investigations on *Botrytis cinerea* since the time of deBary, many points regarding it are still much in need of light, especially the species question, the pathological relation of the fungus to a greater number of plants and the enzymes which it produces. The contributions in this article are to the last two problems. In an attempt to answer the question why so many plants growing under condition especially favorable to the development of *B. cinerea*, are not attacked by it, the author inoculated many species of plants. The strain used was isolated from the petals of *Pelargonium zonale*. The fungus was carefully studied in pure culture on a variety of media and the conditions under which sclerotia and appressoria are developed are briefly set forth. Since Beauverie obtained apothecia from *Botrytis* sclerotia, author hopes to obtain them from his fungus.—For inoculation work bits of agar containing growing mycelium served as inoculum. The leaves of the plants only were inoculated both above and below on each side of the midrib. The tissues on one side of the vein were injured by cutting. Infection took on the wounded side without exception on all the plants. The types of lesions produced are described for different hosts and the rate of spread of the mycelium in the tissues was compared in many of them. These variations in character and rate of development of the lesions resulting from wound infections are attributed to water content, chemical nature and aeration of the leaf tissues.—The action of the fungus on the chloroplastids, nucleus, middle lamella, cell wall, cuticle, etc., is described for a large number of hosts infected through wounds.—Of the 171 plants inoculated without wounding, 84 did not become affected. The factors conditioning penetration through the uninjured epidermis are discussed.—*H. H. Whetzel.*

1628. CAPUS, J. **Sur les invasions du mildiou dans le sudouest en 1916.** [On the invasions of downy mildew in 1916.] Ann. Serv. Épiph. 5: 193–200. 1918.—Correlation of telluric conditions existing in southeastern France with appearance and spread of *Plasmopara viticola* in the vineyards. It is concluded that humidity rather than temperature is the factor of importance in the progress of the disease.—*D. Reddick.*

1629. DAVEY, H. W. **Diseases of fruit trees and their treatment.** Jour. Dept. Agric. Victoria 16: 101–107. 1918.—Contains directions for treatment of the following diseases: black spot of apple and pear, shot-hole of stone fruits, peach leaf curl, Armillaria root rot, collar rot and chlorosis in citrus trees.—*D. Reddick.*

1630. Davis, D. J. **The effect of potassium iodid on experimental sporotrichosis.** Jour. Infect. Diseases 25: 124–131. *Fig. 1–2.* 1919.—Potassium iodid and iodin have relatively little germicidal effect on *Sporotrichum schenkii*, the organism surviving for at least 48 hours in a 10 per cent solution of potassium iodid and 74 days or more in a 1 per cent solution. Potassium iodid given to animals for 8 days previous to inoculation with Sporotrichum will have no effect in inhibiting or preventing the infection. On continued treatment the iodid will cure experimental sporotrichosis. It evidently does not act in a direct way on the Sporotrichum, but through the agency of tissue proliferation and processes incidental thereto. —*Selman A. Waksman.*

1631. de Castella, F. **Vineyard spraying.** Jour. Dept. Agric. Victoria 16: 141–156. 1918.—Descriptions of spraying machinery for vineyards, drawn largely from the French.—*D. Reddick.*

1632. de Castella, F. **Copper fungicides for vine disease.** Jour. Dept. Agric. Victoria 16: 592–599, 674–678, 735–737. 1918.—Summary statement on the preparation of copper fungicides, particularly of Bordeaux mixture, its chemistry, physical properties, adhesion, compatibility, etc.—*D. Reddick.*

1633. de Castella, F. **Downy mildew, Plasmopara viticola (B. & C.) B. & deT.** Jour. Dept. Agric. Victoria 16: 568–574. *6 fig.* 1918.—Downy mildew first appeared in Victoria in 1917. The loss from mildew in 1918 in north-east Victoria is over 90 per cent of the crop. Two per cent bordeaux mixture gave excellent control where used. It is thought that two applications of the mixture will give satisfactory results, but considerable space is devoted to an explanation of telluric conditions and epiphytotics.—*D. Reddick.*

1634. de Castella, F. **Notes on vine black spot or anthracnose.** Jour. Dept. Agric. Victoria 16: 420–425. 1918.—Anthracnose has been unusually prevalent and destructive on account of two successive rainy seasons. Sultanas were practically destroyed in some instances. Swabbing the dormant vines (iron sulfate 35 pounds, sulfuric acid 8 pounds, water 10 gallons) combined with summer spraying with a copper fungicide is recommended. "On thoroughly swabbed vines a very limited number of sclerotia are capable of germinating when placed in a moist chamber at suitable temperature."—*D. Reddick.*

1635. Enfer, V. **Le chancre du poirier. [Pear canker.]** Revue Horticole 91: 217–218. Jan., 1919.—A list of varieties of pears susceptible to canker is given, together with methods of treatment. A canker similar to that of the apple and a list of varieties on which it has been found is mentioned. For the latter disease treatment similar to that for apple canker is detailed, together with the method for preparing and using a bath composed of iron sulfate, sulfuric acid and water which may be applied to the wounds and infected areas.—*E. J. Kraus.*

1636. Farrell, J. **Gnarl of the Gravenstein wood.** *In*: **Apple culture in Victoria.** Jour. Dept. Agric. Victoria 16: 648–652. *Pl. 178–180.* 1918.—"The gnarled wood is produced by the premature hardening of a lengthy section or sections of the cambium, thus preventing sap activity in these parts. Depressions, which run with the length of the affected stem or branch, are thus formed. The free passage of the sap promotes strong growth in the healthy portions, causing elongated protuberances to appear. These depressions, interspersed with the elevations running longitudinally in the surface of the wood, give it a corrugated appearance. This peculiar habit of growth, although generally regarded as being exclusively confined to the Gravenstein, is occasionally noticed in trees of the Missouri Pippin variety. Gnarl in the latter usually supervenes on variety degeneration and general debility, whereas robust specimens of the former are most liable to its attack.—A high percentage of Gravenstein trees become affected, and the twisting of the wood usually commences early in the life of the trees. In many instances, after a few years' growth, the stem is so extensively corrugated, and the sap flow so seriously interrupted, that the whole superstructure col-

apses for want of plant nutriment. When the main arms or sub-leaders only are affected, the stem being healthy, the case is not so serious, because corrugations of the virulent form can bring about the destruction of individual branches only. Scientific pruning will often obviate the production of those undesirable sections or replace them by others of more befitting character."—*D. Reddick.*

1637. FRAGOSO, ROMUALDO GONZÁLEZ. **La "antracnosis" o "rabia" del guisante (Ascochyta Pisi Lib.). [Anthracnose or rabies of peas.]** Bol. R. Soc. Española Hist. Nat. 19: 189–196. *Pl. 5 (colored), fig. 1–3.* 1919.—Author studies a severe epiphytotic of anthracnose on peas encountered in markets of Madrid during the latter part of last winter and early spring. Causal organism is identified as *Ascochyta pisi*. It is compared critically with *Phyllosticta pisicola*.—Discusses reported hibernation of fungus and believes such not to occur but that the fungus is propagated by pycnidia and conidia remaining on the ground in dead parts of the plant, this infecting next crop.—Contrary to some authors the fungus penetrates and attacks the seeds in the pod. Completing often the destruction begun by the *Ascochyta* the author finds commonly two fungi, *Cladosporium pisi*, and a form of *Macrosporium commune* which is published as new (*M. commune f. Pisi*), illustrated and described fully. Differs from type in having conidiophores up to 70 x 7 μ or even 125 x 7 μ, apically inflated, 15–56 x 9–21 μ. Author discusses briefly methods of treatment.—*O. E. Jennings.*

1638. KIRK, T. W. **Control of brown-rot of stone fruits: The past season's experiments.** New Zealand Jour. Agric. 18: 272–284. 1919.—It is stated that all the preparations used failed to prevent the disease entirely. Judicious thinning of fruits and the destruction of infected fruits is advised, to minimize the possibility of infection.—*E. R. Hodson.*

1639. KLEBAHN, H. **Impfversuche mit pfropfbastarden. [Infection experiments with graft hybrids.]** Flora 111–112: 418–430. *9 fig.* 1918.—In the experiments *Solanum lycopersicum* proved susceptible to the attacks of *Septoria lycopersici* while *S. nigrum* is immune. *S. tubingense*, which has epidermal tissue of *S. lycopersicum* and inner tissue of *S. nigrum*, proved highly resistant. Mycelium was found in the leaf but very small flecks were produced and the fungus did not fruit.—*Solanum proteus*, having a double layer of tomato tissue on the outside with additional areas of tomato tissue scattered promiscuously, proved susceptible. Pycnidia were formed, but were found most abundantly in the vicinity of tissue recognizable as tomato tissue (oxalate cells).—*S. koelreuterianum*, epidermis of *S. nigrum*, inner tissue of tomato, proved susceptible. Large blackish spots were formed on which pycnidia appeared later. Failure of the epidermal tissues to protect is attributed to the fact that infection is stomatal.—*S. gaertnerianum*, having a double layer of nightshade tissue about tomato tissue and with additional areas of nightshade tissue scattered promiscuously, proved immune in experiments performed in 1913. In later experiments some spots were formed on which pycnidia appeared. The pycnidia were always closely associated with tissue recognizable as tomato tissue.—*S. darwinianum*, having epidermis and inner tissue of *S. nigrum* separated by areas of tissue representing somatic cell fusions of the two species, is like *S. koelreuterianum*.—*S. lycopersicum gigas*, a giant form, among other things having chromosomes double the usual number, is as susceptible as the common tomato.—*Cladosporium fulvum* acted like *Septoria* on those chimeras tested.—*D. Reddick.*

1640. KOTILA, J. E. **Frost injury of potato tubers.** Rept. Michigan Acad. Sci. 20: 451–460. 1918.—Tubers kept at room temperature for 5 days after being subjected to a temperature of −13°–17°C. for 3–4 hours showed necrosis injury; when exposed to temperature of −13° to −17° for five or more hours, less injury than when exposure was for 3 to 4 hours; and when exposed to −5° to −11° for 24 hours they showed darkening of the tissues. Exposure of tubers to a temperature of −13° to −17° for 4 hours killed the sprouts. [See Bot. Absts. 2, Entry 863.]—*Charles R. Stevenson.*

1641. LAIDLOW, W., AND C. C. BRITTLEBANK. **Black spot and leaf curl.** Jour. Dept. Agric. Victoria 16: 479–488. *11 fig.* 1918.—Experiments for the control of leaf curl of peach and apricot (*Exoascus deformans*) show that spraying with verdigris (3 pounds in 40 gallons

of water or copper soda (6:8:40) is effective. Bordeaux mixture (6:4:40) does not give as good results and lime-sulfur solution (1:9) was not a success. Copper soda is recommended.—"By spraying the trees just before or when the earliest buds are showing pink, leaf curl can be cured."—Black spot of apple (*Venturia inaequalis*) was controlled by the use of lime-sulfur solution. Of the 6 varieties included in the trials 5 were sprayed twice, both applications being made before the trees were in full bloom. Illustrations show that first application (1:15) was made before the blossom clusters had separated, the second (1:35) when many of the blossoms had opened. Satisfactory results were secured.—*D. Reddick.*

1642. Lewis, C. O. **Premature deterioration of fruit.** Better Fruit 13[1]: 5–7. 1919.—This is a popular address delivered before the Oregon State Horticultural Society, Roseburg, Dec. 7, 1918.—Burning, overmaturity, cracking, "drought spot," Jonathan spot, bitter pit, cork, fruit pit, dry rot and water core are cited as cases of premature deterioration of fruit. Lack of moisture in the soil during time of maturity of fruit or irrational irrigation, together with disturbances in nutrition, are given as possible causes of most of premature deterioration of fruit.—*A. E. Murneek.*

1643. Lüstner, G. **Über die seither in Österreich und Deutschland mit Perozid angestellten Peronospora-Bekämpfungsversuche und ihre Ergebnisse. [Summary of the use of perocid in Germany and Austria for the control of grape downy mildew.]** Mitt. Weinb. u. Kellerw. 1917: nos. 9 to 12; 1918: nos. 1 to 2.—Perocide and "Rohperozid" are not so good as Bordeaux mixture but in average years, give satisfactory control of downy mildew. The substances are easy to apply, they spread well and have good adhesion. Injury from their use is now practically negligible. [Through abst. by O. K. (irchner) in Zeitschr. Pflanzenkr. 29: 61. 1919.]—*D. Reddick.*

1644. Macoun, W. T. **Blight resistant potatoes.** Canadian Hortic. 42: 129–156. 1919.—Eight hundred varieties of potatoes have been grown at the Central Experimental Farm, Ottawa, Canada, during the past thirty years. Fifty-three varieties were eventually selected as apparently most resistant to late blight, and of these the following ten varieties were outstanding in resistance: King Edward, Dalmeny Beauty, Factor, Hard to Beat, Highlander, Duchess of Cornwall, White Giant, Dr. Maerker, Sirdar, Holborn Abundance. Of these all but the White Giant originated in Europe, where special attention has been paid to blight resistance.—*E. F. Palmer.*

1645. Marchal, P., and G. Arnaud. **Rapport phytopathologique pour les années 1916 et 1917. [Phytopathological report for the years 1916 and 1917.]** Ann. Serv. Épiph. 5: 1–35. 1918.—A long list, with short notes, of the insects and diseases affecting plants in France in 1916 and 1917.—Regulatory measures for the protection of plants and an account of the organization effected to combat plant pests and diseases.—*D. Reddick.*

1646. Miehe, Hugo. **Anatomische Untersuchung der Pilzsymbiose bei Casuarina equisetifolia nebst einigen Bermerkungen über das mykorhizenproblem. [Anatomical investigation of fungous symbiosis in C. e. with remarks on the mycorhiza problem.]** Flora 111–112: 431–449. *Pl. 6, 2 fig.* 1918.

1647. Montemartini, Luigi. **Esperienze di lotta contro la Peronospora delle patate. [Experiments on the control of potato late blight.]** Revist. Patol. Veg. 9: 126–130. 1919.—Demonstrations of spraying for the control of *Phytophthora infestans* on the potato were carried out at four places. One or two applications were made of dilute copper sulphate solution, Bordeaux mixture or "pasta caffaro" (a commercial Bordeaux paste). Increased yields ranged from 30 to 100 per cent. Potatoes from the sprayed portions of the fields also showed greater specific gravity, and a higher percentage of starch and of dry matter.—*F. M. Blodgett.*

1648. MOSLEY, F. O. **Fungoid and insect pests and their control. I. Vegetable and pulse drops.** *96 p., 53 fig.* F. O. Mosley: Reading, 1918.

1649. MÜLLER, KARL. **Rebschädlinge und ihre neuzeitliche Bekämpfung. [Diseases and insect pests of the grape and modern methods of combating them.]** *203 p., 2 pl. (colored), 1 map, 65 fig.* G. Braun: Karlsruhe i. B., 1918.—Abst. in Zeitschr Pflanzenkr. 29: 55-56. 1919.

1650. NOWELL, W. **The root disease or red ring disease of coconut palms.** Agric. News [Barbados] 18: 46. 1919.—Continuation of previous notes (Agric. News 17: 298). Nematode worms found in all stages in diseased roots of Trinidad trees, exactly as in Grenada. Red cylinder in stem, which is a characteristic feature of the disease, was found to be breeding ground of the worm. Bases of leaf stalks may also be affected. Disease spreads from tree to tree but mode of infection remains to be discovered. Important to destroy stems, more so than roots. Name "red ring disease" now considered more appropriate than root disease.—*J. S. Dash.*

1651. NOWELL, W. **Foot rot or mal di gomma on limes.** Agric. News [Barbados] 18: 62. 1919.—The lime tree in the small West Indian islands is not very subject to this disease. Begins very often in the hollows formed by junction of roots with stem. Exudation of gum generally takes place, followed by drying up or rotting of bark. Regarded as being non-parasitic in origin and brought on by heavy soils, poor drainage and too deep or close planting. Tree surgery followed by use of wood preservative is recommended, the necessary attention being given to cultivation and drainage.—*J. S. Dash.*

1652. PETHYBRIDGE, GEORGE H. **A destructive disease of seedling trees of Thuja gigantea Nutt.** Quart. Jour. Forest. 13: 93-97. 1919.—Young larch and *Thuja* trees growing at the forestry station at Baumreagh, Queen's County, Ireland, were being killed. No fungus was visibly associated with the young larch; investigations of specimens showed, however, that the leaves and twigs were thoroughly permeated with the mycellum of *Botrytis*. This was, in all probability, the cause of the trouble.—The *Thujas* were 3 years old, about a foot or less in height, and nearly all quite dead. On the dead leaves small, rounded, flattened, brownish black, more or less gelatinous pustules were found in large number. When the diseased material became dry, the pustules became more or less hard or horny in texture. The fungus proved to be *Keithia thujina*. As far as known, this fungus has not been found elsewhere in the British Isles. Where cases of the disease occur in nurseries the dead and dying young trees should immediately be pulled up and destroyed.—*C. R. Tillotson.*

1653. RICHTER. [Rev. of: BARTOS, W. **Einige Beobachtungen über die Rostkrankheit des Rübenkrautes. (Observations on the rust diseases of beet tops.)** Blätter für Zuckerrübenbau 24: 152. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 263-265. 1918.—The sugar content of beets with sound, leafy tops was 22.02 per cent while that of diseased tops was 21.48 per cent. The sound beets produced about 340 g. of tops each, while the ones affected by rust produced only about 320. The yields of sugar were in the same relation as the weights of tops. Seed of these two types was planted the following year. The difference in the appearance of the two types was visible for some distance, the leaves of the plants affected with rust had a brownish color. The sugar content was 1.5 per cent lower in the beets with diseased tops.—*F. M. Schertz.*

1654. RITZEMA BOS, J. **Bijdrage tot de kennis van de werking der bordeauxsche pap op de aardappelplant. [A contribution to the knowledge of the action of bordeaux mixture on the potato plant.]** Tijdschr. Plantenz. 25: 77-94. 1919.—It is common knowledge that bordeaux mixture acts upon the potato plant as well as on the pathogene, *Phytophthora infestans*. Its action upon the latter is alone on the germ tube of the conidium or swarmspore due to the solvent action of acid secretions from the protoplasm on the fungicide.—The bordeaux may injure the potato plant through wounds which lay bare the cells beneath the

cuticle, the acid sap of the cells acting to dissolve some of the copper the same as the germ-tubes of *Phytophthora*.—The literature dealing with the effects of bordeaux mixture on uninjured healthy potato plants is reviewed in considerable detail, the conclusion being that the shading due to the mixture is probably the active factor. To test this the author conducted four sets of experiments with the blight resistant Red Star potato, having in each an unsprayed plot, one sprayed with lime milk, and one with bordeaux. Plots sprayed with lime milk gave the highest yield, that of the bordeaux being next highest in spite of the fact that the latter remained green from two to three weeks longer. The author's results thus support the conclusion that the beneficial effects of bordeaux on healthy plants is to be attributed to the shading it produces during very sunny seasons, while for the same reason the yield is reduced in cloudy seasons. These experiments are to be repeated on a more extensive scale in 1919.—*H. H. Whetzel.*

1655. Ritzema Bos, J. **De gevolgen van een fout bij het snoeien van laanboomen.** [The results of an error in pruning shade trees.] Tijdschr. Plantenz. 24 (Bijblad): 49–51. 1918.—A popular presentation of the injurious results of leaving stubs in pruning, with special reference to attacks of *Nectria cinnabarina* through such wounds.—*H. H. Whetzel.*

1656. Rosen, H. H. **A preliminary note on a bacterial disease of foxtail.** Science 49: 291. 1919.—The disease appeared on foxtail (*Setaria glauca*) at Fayetteville, Arkansas, from September to November. Leaves, flowering stalks and glumes became spotted and streaked with dark brown areas. The pathogene, a white, rod-shaped bacterium, was isolated and grown in pure culture. By spraying and by needle smears, the following plants were infected: wheat, oats, rye, barley, corn and Sudan grass. The organism may be *Pseudomonas avenae*.—*A. H. Chivers.*

1657. Schoevers, T. A. C. **Nieuwe ziekten, waarop gelet moet worden.** [New diseases, which may become dangerous.] Tijdschr. Plantenz. 25: 95–98. 126–128. 1919.—There was observed in different places in Holland in 1918 a hitherto unreported disease of spinach. The symptoms exhibited were: a languishing and yellowing, with poor growth and final death of the plants in spots here and there in the beds. Affected seedlings showed a crumpling of the cotyledons. The tap root of disease plants was constricted for some distance below the crown, with a brownish discoloration of the tissues. Side roots were usually wanting or had taken the place of the tap root but showed the brown constrictions. Growing root tips were wanting. Microscopic examination showed the contents of the cortical cells of the constricted region dead. The walls were brown; those of the vessels also darker than normal. Minute protozoan-like bodies filled many of the cells, especially those of the cortex, but occurred also in the cells of the endodermis, vascular bundles and root hairs. The organism is described in Mededeelingen van de Landbouw-hoogeschool, part 15, page 75. Attempts to reproduce the disease by growing plants in soil from diseased areas failed. The nature of the bodies in the cells of diseased roots has not been determined.—In tomatoes, petunias, asters, wall-flowers and *Gilia tricolor* there has been reported from Ireland by Pethybridge and Lafferty (Scientific Proc. Roy. Dublin Soc. 15: —. 1919) a new disease caused by a heretofore undescribed fungus, *Phytophthora cryptogea*. While this has not yet been reported from Holland the writer rather expects it may occur there. He reviews the paper of the above authors in some detail, especially that dealing with symptoms and soil infestation in order that Dutch growers may acquaint themselves with the disease and be on the lookout for it.—*H. H. Whetzel.*

1658. Schoevers, T. A. C. **Wat nu in den boomgaard gedaan kan worden ter bestrijding van ziekten en plagen.** [What may now be done in the orchard toward combatting diseases and pests.] Tijdschr. Plantenz. 25 (Bijblad): 1–4. 1919.—Timely notes on the more common fungous and insect pests of the orchard that may be combatted to some extent by pruning in the early spring. The diseases discussed are: monilia-rot, scab, cankers and witches' brooms.—*H. H. Whetzel.*

1659. SCHOEVERS, T. A. C. **Het krullen van tomatenbladeren. [The rolling of tomato leaves.]** Tijdschr. Plantenz. 25 (Bijblad): 11–12. 1919.—The author calls attention to the frequent rolling of the lower leaves of tomato plants and points out its similarity to the leaf roll of potatoes. Quanjer has shown that the stems of leaf-rolled tomato plants are free from phloem necrosis. The author believes, however, that the rolling of the leaves results in both cases from the abnormal accumulation of reserve food stuffs in the leaves; in case of the potato as a result of the destruction of the phloem; in the tomato from severe pruning which eliminates the food-assimilating structures, the young shoots. This conclusion is supported by an experiment in which the author grew twelve tomato plants six of which were pruned in the usual manner. The leaves of the pruned plants were strongly rolled while the unpruned plants showed no trace of rolling in their leaves.—*H. H. Whetzel.*

1660. SMITH, R. C. **Ear worm injuries to corn and resulting losses.** Jour. Econ. Entomol. 12: 229–233. *Pl. 11.* 1919.—Brief mention of progress of silking of corn ears, with reference, is made; also mention, with reference, to bacterial and mold activity in corn ear following the work of the corn ear worm (*Chloridea obsoleta*) and the effect produced on live-stock that had eaten grains thus affected.—*A. B. Massey.*

1661. STEVENS, NEIL E., AND FRED W. MORSE. **The effect of the endrot fungus on cranberries.** Amer. Jour. Bot. 6: 235–241. *3 fig., 1 table.* 1919.—The disease known as endrot of cranberries, caused by *Fusicoccum putrefaciens* Shear, is described as to its external characters and as to the course and behaviour of the fungus in the tissues of the fruit. The mycelium penetrates the whole berry, except the cuticle and seeds, and the hyphae pierce the cell wall and enter the cytoplasm. Chemical studies show that "the sugar content of berries rotted by the endrot fungus is much lower than that of sound fruit," thus suggesting that the fungus makes use of the sugar. No other constant chemical difference was observed between rotted and sound fruit.—*E. W. Sinnott.*

1662. STRÁNÁK, F. **Beiträge zur histologischen und physiologischen Erforschung der bakteriillen Krankheit der Gefässbundel der Kartoffelknollen. [Contribution toward histological and physiological investigation of the bacterial disease of the vascular tissue of the potato tuber.]** Centralbl. Bakt. II, 48: 520–543. *2 fig.* 1918.—An account of a bacterial disease of the potato, manifest by dying of the sprouts before reaching the surface of the ground, stunting and dying of the tops, translucent and brownish discoloring and spotting of the stem, black spotting of the vein regions of the leaves, failure to set tubers or the development of tubers either entirely normal or with the vascular region partly or entirely discolored grayish-brown to black. By analysis, healthy tubers show a higher acidity and a greater percentage of magnesium, water and, in most cases investigated, of potash than diseased ones; consequently, fertilizing with potash and magnesium is suggested as a possible means of control. Tubers of susceptible varieties show a thinner skin, fewer layers of cork cells and more often a higher water content than tubers of more resistant varieties. Rod-shaped bacteria found abundantly in the darkened regions of the tubers are thought to cause the disease and it is also thought that they are transmitted by way of the seed-piece. —*Charles R. Stevenson.*

1663. TAUBENHAUS, J. J. **Pink root of onions.** Science 49: 217–218. 1919.—The disease is confined to the roots only, and not to the bulb. Affected roots turn yellow, then pink, and finally dry. The bulb spends its energy producing new roots which in turn become affected. Hence the failure of the bulbs to reach commercial size. Average annual loss in Webb County estimated at 40 per cent. The disease is caused by an apparently new pathogenic organism, to which the name *Fusarium malli*, n. sp. is to be applied. Results of experiments are summarized as follows: The organism is carried with infected sets and remains in the soil from year to year, attacking onions, garlic and shallot. Steam sterilizing and treatment with formaldehyde at the rate of 1 pint to 20 gallons of water, per square foot [So in original.] will rid the soil of the fungus. Lime will not kill the fungus in the soil.

In infested soils, liberal application of fertilizers, especially those rich in nitrogen and humus, aids in producing fairly normal yields. Author first reported the disease in Phytopath. 7: 59. 1919.—*A. H. CMvers.*

1664. TUNSTALL, A. C. **A stem disease of tea caused by Nectria cinnabarina (Tode) Fr.** *6 p., 4 pl.* Indian Tea Assoc.: Calcutta, 1918.—The diseased bushes become moribund, but rarely die outright. The stems die back, and new shoots, generally thin and weak, spring up from below. The bark, cambium, medullary rays, pith, and wood are affected, the fungus apparently gaining entrance through wounds. Descriptions of the fungus by the author, by Wilson and Seaver, and from Saccardo are given, also a list of synonyms by Seaver.—The flowering shoots of *Alnus nepalensis*, *Pyrularia edulis*, and *Erythrina* are attacked by the fungus and serve as sources of inoculum. Control measures recommended are: eradication of trees (in immediate neighborhood) harboring the fungus; pruning diseased bushes in "cold weather," followed by spraying with a fungicide; and burning of prunings. [See Bot. Absts. 3, Entry 1199.]—*J. I. Lauritzen.*

1665. TURCONI, M. **Un nuovo parassita dei peperoni (Acrothecium Capsici n. sp.)** [**A new parasite of pepper.**] Revist. Patol. Veg. 9: 131–133. 1919.—In examining some peppers (*Capsicum annuum*) sent from the Royal normal school of Turin some were found with yellowish white areas, which later became dark-colored, due to the fruiting bodies of *Alternaria tenuis*, a common saprophyte. There were other round or oval depressed spots, 1–3 centimeters in diameter, of hazel color with chestnut brown margins, in which appeared a thin, olivaceous yellow mold which the author names *Acrothecium capsici*. A technical description is given.—*F. M. Blodgett.*

1666. VAN DER LEK, H. A. A. **Over de z. g. verwelkingsziekten, in het bijzonder die, welke door Verticillium alboatrum veroorzaakt worden.** [**Regarding the so-called wilt diseases, especially those caused by Verticillium alboatrum.**] Tijdschr. Plantenz. 24: 205–219. *Pl. 4, fig. 1–3.* 1918. *Ibid.* 25: 17–52. *Pl. 1–2, fig. 1–4.* 1919.—In an introduction of 14 pages, the author first records an exceptionally severe outbreak of Verticillium wilt of potatoes in Holland in 1918, and also its occurrence in tomatoes, cucumbers and melons. He also presents a rather detailed and critical review of the literature dealing with Verticillium diseases, examining especially the evidence on host range, biological strains, identity of *Verticillium* and *Acrostalagmus* species, the disease in woody plants, and the peculiar position of the potato as a host of *Verticillium*. In this last connection he calls attention to the recorded inability of *Verticillium* strains from perennial hosts to infect annuals, while strains from the latter readily attack the former. This he attributes to a loss of virulence due to continuous confinement to a perennial host. He here reports for the first time isolation of *Verticillium* from *Thuya*, *Prunus* (cherry), *Ampelopsis veitchii* and *Ribes* (currant).—Parts II, III and IV in volume 25. They are devoted respectively to a consideration of: variations in the symptoms of the disease in the same and different hosts; the potato verticilliose in particular; and dissemination and methods of combating the pathogene. An addenda presenting some observations on papers appearing after this article went to press completes the contribution.—After discussing the physiology of wilting in plants the author points out that this is rather rare as a symptom of Verticillium diseases. When it does occur he holds it is due to a killing of the rootlets growing in infested soil. Plants so affected usually recover shortly to show later the more common symptoms; dwarfing, dead spots with yellowish borders in the leaves or the slow dying of leaves on the stems from below upwards. In his opinion wilting rarely or never occurs in potato plants infected from diseased mother tubers. He rejects the theory of wilting due to toxic substances secreted by the fungus, as also that of the plugging of the vessels by the mycelium.—In part three is presented evidence to support the conclusions that diseased mother tubers give usually infested daughter tubers, while healthy tubers from diseased plants never produce diseased plants; that the fungus spreads slowly during storage from the stem end through the vessels toward the eyes; that the variations in symptoms so often noted for this disease especially in potatoes, is to be ex-

plained primarily by the character of the initial invasion, whether from infested soil or from diseased seed tubers.—The very general appearance of the disease in so many hosts in 1918 throughout Holland is attributed chiefly to the severe drought of that season. The habit of overwintering in the potato tubers is chiefly responsible for the general and widespread distribution of the fungus. Nothing new on the control of the disease is offered. The author concludes after reviewing the possible lines of attack that the development of resistant varieties in the most promising.—*H. H. Whetzel.*

1667. VERHOEVEN, W. B. L. **Zaaigraanonsmetting. [Disinfection of seed grain.]** Tijdschr. Plantenz. 25: (Bijblad): 5–10. 1919.—Specific directions are given for the seed treatment of the common cereals, wheat, oats, barley and rye, for protection against the common nuts, *Fusariums* and *Helminthosporiums*, which are seed borne.—*H. H. Whetzel.*

1668. [POPP, M.] [Rev. of: WAGNER, R. J. **Wasserstoffionenkonzentration und natürliche Immunität der Pflanzen (Hydrogen-ion concentration and natural immunity of plants.)** Centralbl. Bakt. 33: 708–719. 1916.] Biedermann's Zentralbl. Agrikulturchem. 47: 258–259. 1918.—Injections of phytopathogenic bacteria cause plants to respond with variations in the hydrogen-ion concentration. Immediately after injection the acidity decreases. At the end of the incubation period the acidity rises 0.2 to 0.3 per cent. If the plant is able to withstand the infection the acidity then falls back to normal. If the plant is unable to withstand the infection the hydrogen-ion concentration rises to a very high level and then falls usually below the normal. If the infection is fatal there is usually a post-mortem rise in acidity.—*F. M. Schertz.*

1669. WOLF, F. A., AND R. O. CROMWELL. **Clover stem rot.** North Carolina Agric. Exp. Sta. Tech. Bull. 16. *18 p., 3 pl.* 1919.—First evidence of the disease is a sudden wilting of stem and leaves. These portions succumb quickly turning yellowish and then brown. The stems near the surface of the ground and stool are involved and are covered with a more or less profuse mould-like growth. This is followed by the formation of black sclerotia on the decaying stems. The roots are also involved and sclerotia formed on them remain in the soil. The disease is prevalent from October to May and spreads outward from localized areas causing an uneven stand. Under favorable conditions the stand may be rather uniformly destroyed. *Sclerotinia trifoliorum* is the cause of the disease. The hosts are red clover, crimson clover, white clover, alsike clover, and alfalfa. Comparative studies of *S. trifoliorum* and *S. libertiana* were made and lettuce and crimson clover were infected when inoculated with either organism. Comparative morphological studies indicate that *S. libertiana* and *S. trifoliorum* are distinct species.—Fungus may be disseminated by sclerotia mixed with the seed at harvest time. Other agencies of dissemination are contaminated soil, implements, and hay. The organism is kept alive in soil by sclerotia which remain dormant for some time. Burial of the sclerotia by deep plowing, avoidance of contaminated seed, exercise of care when soil is used to inoculate new fields with legume bacteria, avoidance of use of manure from stock fed on hay from infested fields, and adoption of a system of crop rotation are recommended as control measures.—*R. A. Jehle.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOZY

HENRY KRAEMER, *Editor*

NEW PLANTS FOR PHARMACEUTICAL USES

1670. ARIAS, BERNARDO. **Una planta util. El cilantro de la tierra. [Coriander, a useful plant.]** Revist. Agric. Com. y Trab. 2: 343. *1 fig.* 1919.—Attention is called to use as a condiment and medicine of *Eryngium foetidum* Linn., a plant common in Cuba.—*F. M. Bludgett.*

1671. FLETCHER, GEO. **Red Cross work at the Royal College of Science.** Jour. Dept. Agric. Ireland 19: 322–326. 1919.—Describes sphagnum moss and its collection and use for medical purposes.—*Donald Folsom.*

1672. Menon, C. Raeunakara. **Embelia ribes—a medicine for influenza.** Indian Forester 45: 210. 1919.—Root decoctions of the plant—Family Myrsinaceae—reported as an effective cure and preventive of influenza during the recent epidemic in South Kanara.—*J. R. Schramm.*

1673. Viehover, Arno. **Chinese colza—A valuable new oil seed.** Oil, Paint and Drug Reporter 96[2]: 53. *4 fig.* 1919.—Calling attention to the shifting centers of production due to war conditions, the author refers to the increased importance of oriental countries as sources of oil seeds. Prior to the war Chinese and Japanese seeds were practically unknown in U. S. A. But so great is the shortage in Europe that these oil seeds are likely to come into American markets from the Orient for some years. Entering at San Francisco, these Chinese seeds were at first marketed as "Golden Gate" seeds and offered as mustard, to which they bear a striking resemblance in appearance. They are quite lacking in pungency, however, and taste more like cabbage than mustard. The seeds are somewhat smaller than those of white mustard which they closely resemble except in taste. They were identified as the seed of *Brassica campestris, var. Chinensis*, related to the "China cabbage" and "celery cabbage." The microscopic characters are similar to those of the common colzas or rape seeds. They yield 40–50 per cent of fatty oil similar to that from rape. The marc yielded, upon maceration with water, from 0.4 to 0.6 per cent of a volatile oil, identified as "crotonyl mustard oil," found also in rape seed, and quite different in physiological characters from the volatile oil "allyl mustard oil" obtained from the true mustards. Crotonyl mustard oil is but slightly pungent and irritating and is not poisonous, while allyl mustard oil is highly irritating and poisonous. The basal leaves of the young plant are succulent and should be valuable for salad. The plant is hardy and may prove a desirable forage crop. Illustrations of the fruiting plant, the basal leaves and the seeds, both yellow and brown, accompany the article, the complete manuscript of which will be published in a bulletin of the Department of Agriculture.—*W. B. Day.*

MEDICINAL PLANT CULTURE AND PREPARATION

1674. Alsberg, Carl L., Arno Viehoever, and Clare Olin Ewing. **Some effects of the war upon crude drug importations.** Jour. Amer. Pharm. Assoc. 8: 459–471. 1919.—A comprehensive report of the effect of war conditions on drug imports and spices. Eighteen well known drug products are considered, the data being set forth in tabular form showing the imports (in thousands of pounds), declared value per pound and wholesale price of selected grades for the years 1913 to 1918 inclusive. Imports of these eighteen commodities with the exception of buchu, gentian and crude opium showed a marked falling off from the figures of 1913, these products being among the list of those on which new tariff duties were placed. An interesting account of drug adulteration follows which the authors divide into five sections as follows: (1) Material containing toxic foreign matter; (2) Material of value as substitutes for recognized products; (3) Material unsuitable for use as substitutes for recognized products, but valuable for other purposes; (4) Material of uncertain value, requiring further study; (5) Material of no known value. Data is presented on adulterations under the various divisions.—*Anton Hogstad Jr.*

1675. Cushman, Allerton S. **Growing medicinal plants in America.** Jour. Heredity 10: 32–38. *Fig. 1–3.* 1919.—See Bot. Absts. 3, Entry 1061.

1676. Clute, Willard N. **Officinal drugs of the United States.** Amer. Bot. 25: 47–50. 1919.—A list of the native plants that may be substituted for official drugs with notes on how and where to sell them.—*W. N. Clute.*

1677. Cock, M. M. A. **Valeriana officinalis.** Pharm. Weekblad 56: 735–755. 1919.—The best paper submitted in a contest on this subject conducted by the Dutch society for the advancement of pharmacy. The author gives a very complete description of the plant in the different stages of development, of its cultivation and of the chemical estimation of its constituents.—*H. Engelhardt.*

1678. COOMBES, G. **British plants of medicinal value.** South African Gard. 8: 57–58. 1919.

1679. CUNAEUS, E. H. J. **De proeftuin voor Genoeskruiden te Delft in 1918. [The experimental garden for medicinal plants at Delft in 1918.]** Pharm. Weekblad 56: 351. 1919.—A report in regard to plants and seeds obtained in cultivating medicinal plants. It comprises 25 different plants and 64 species of seed. The results of the experiments were very satisfactory.—*H. Engelhardt.*

1680. FAIRBRIDGE, DOROTHEA. **South African herbs. I and II.** South African Gard. 9: 79–81. *150 fig.* 1919.

1681. GUÉRIN, P. [Rev. of GORIS, A., AND DEMILLY, J. **La culture des plantes médicinales. Préface de M. L. Guignard, Vigot fr., edit., Paris, 1919. (The cultivation of medicinal plants. With a preface written by M. L. Guignard.) Vigot Frères: Paris, 1919.**] Bull. Sci. Pharm. 26: 339. 1919.

1682. HAMILTON, HERBERT C. **Digitalis leaves: Effect on activity of temperature in drying.** Jour. Amer. Chem. Soc. 41: 125–130. 1919.

1683. HAMILTON, HERBERT C. **Pharmacological assaying.** Jour. Amer. Pharm. Assoc. 8: 49–64. 1919.—Author presents a historical and descriptive discussion of pharmacological assaying in general, followed by a summary of the work accomplished on the assay of *Cannabis sativa*, Ergot, the Digitalis series, pituitary gland and suprarenal gland. With bibliography.—*Anton Hogstad, Jr.*

1684. KILMER, F. B. **The study of drugs.** Amer. Jour. Pharm. 91: 139–147. 1919.—The author briefly reviews the present knowledge of several of our more common drugs as belladonna, aconite, aloes, etc., pointing out the fact that very little is really known about them at the present time. "As pharmacists we are most interested in its active principle. What is the active principle of belladonna? The usual answer is "atropine." Is this the correct answer? Investigation has shown that atropine does not exist in cultivated belladonna, nor indeed in belladonna when carefully handled and dried. Atropine is a product, or a derivative, produced during the manipulation of the drug."—*Anton Hogstad, Jr.*

1685. KOCH, GEORGE P. **The cultivation of medicinal plants.** Jour. Amer. Pharm. Assoc. 8: 275–281. 1919.—A short history of the cultivation of medicinal plants, which had its inception in the middle of the sixteenth century, is given. The impetus given the industry in this country, as a result of the recent war and consequent check on the importation of crude drugs, is touched upon, as well as the experimental work carried out by federal and state governments in their endeavor to help make it a profitable enterprise. Detailed methods are given for the proper handling and cultivation of belladonna, hyoscyamus, digitalis, cannabis, and stramonium.—*Oliver A. Farwell.*

1686. KOCH, GEORGE P., AND J. RUSSELL BUTLER. **Digitalis purpurea.** Amer. Jour. Pharm. 91: 211–221. 1919.—A comprehensive report on a number of experiments covering the most important phases of the cultivation of *Digitalis purpurea*, so that a successful and paying crop may generally be obtained even in localities not exceptionally favorable for its growth. The paper includes a study of germination, planting, effect of fertilization, effect of certain inorganic salts upon the growth and active constituents, effect of drying at different temperatures upon the activity. With summary and bibliography.—*Anton Hogstad, Jr.*

1687. KOCH, GEORGE P. **Hyoscyamus Niger.** Amer. Jour. Pharm. 91: 68–83. 1919.—Author presents data on the commercial culture of *Hyoscyamus niger* which includes a study of the following: seed germination, effect of inorganic fertilizers upon growth and development, control of insects, seed formation, alkaloidal content and the utilization of the various

parts of the plant. As to the latter the author reports that the stems, collected when the plants are green, can probably always be utilized in conjuction with the leaves and the total alkaloidal requirement of the U. S. P. of 0.065 per cent, be met. With summary and bibliography.—*Anton Hogstad, Jr.*

1688. Polak's Frutal Works. **Pepermunt cultuur in Nederland. [Cultivation of peppermint in Holland.]** Pharm. Weekblad 56: 41. 1919.—Peppermint cultivated in Holland yielded an oil which compared favorably with American oil obtained from peppermint cultivated in Wayne County, Michigan.—*H. Engelhardt.*

1689. Woodhams, E. L. **The commercial growing of some European drugs in Michigan.** Jour. Amer. Pharm. Assoc. 8: 478–482. 1919.—Author discusses the various problems confronted in the commercial cultivation of belladonna and hyoscyamus in Michigan.—*Anton Hogstad, Jr.*

COMMERCIAL SUPPLIES

1690. Howard, B. F. **The trade in Cinchona bark.** Amer. Jour. Pharm. 91: 231–233. 1919.—A brief review of an article on the future of the trade in Cinchona bark, which appeared in Bull. Imp. Inst. 16². 1918. Reference is made to the history of this bark but the paper deals for the most part with its production. The author states that Java heads the list of producers, with an annual output of 22,880,000 pounds, India supplying 2,000,000 pounds and other countries 440,000 pounds. Although from a commercial point of view, the plantations in St. Helena and East Africa are at the moment negligible, yet from the scientific aspect the typical analyses given are of considerable interest as they show a high percentage of quinine and prove the bark to be well up to the Java standard, thus indicating the most successful cultivation—which may have been either deliberate or accidental. (Reprinted from Jour. Soc. Chem. Ind., Feb., 1919.)—*Anton Hogstad, Jr.*

1691. Anonymous. [Rev. of: William Mansfield. **Squibb's atlas of the official drugs.** *686 p., illust.* 1919.] Druggists Circ. 63: 243. 1919.—All the drugs of the Pharmacopoeia and National Formulary are illustrated (in the atlas) in halftone from photographs of drugs selected by the author. Under each drug name are given the official title, synonyms, parts used, permissible limits of impurities, assay, official preparations, and much other essential information. Contains a glossary of botanical terms; tables of assays and of doses; and a very comprehensive index.—*Oliver A. Farwell.*

1692. Marie-Victorien, Fr. des E. C. **Notes recueillies dans la region du Tamiscamingue. [Notes collected in the region of the Temiscaming, Quebec.]** Naturaliste Canadien 45: 163–169. May, 1919.—In the course of a botanical exploration in June, 1918, the author had an opportunity of making inquiries from the Indians and missionaries in the region of Lake Temiscaming, far up and north of the Ottawa River, as to the names and supposed or real virtues of many of the wild native plants and trees. The traditional pharmacopoeia of these Indians is likely soon to disappear. As a rule they are not disposed to be free with such information. They are ready to bring an ingredient or a decoction prepared, but slow to show where to get the material. Author's chief authorities are: R. P. Beaudry, O.M.I., curé of North Temiscaming; Mr. John King, chief of the Algonquins of Nédelec reserve; Mme. Vaya, an Indian resident at Ville-Marie; and Mr. Carufel, a hunter living at Lac des Quinze on Bay Gilies.

Thuya occidentalis is used as a poultice in rheumatism, in labor, for the resolution of ankylosis, and in a vapor bath for pleurisy, the heat being generated by hot stones dropped into the bath well charged with the branches. *Sarracenia purpurea* is assumed to be a sovereign remedy for small-pox and for the healing of any kind of sores. *Sorbus Americana* is believed to be a very general health stimulant. Portions of the spray of the following boiled for some hours is used to purify or strengthen the blood: *Sorbus Americana, Picea marina, Picea*

Canadensis, Gaultheria procumbens, Sambucus Canadensis, with a little wine. *Coptis trifolia* is used to cure sores of the mouth and to excite appetite; and also to allay inflammations of the skin. *Cirsium arvense* is used against eruptions generally, especially those caused by *Rhus toxicodendron*. By seeking out the latter plant which caused a poisoning, and boiling it in a kettle of water and finally pouring the whole into the water, the poison spell is said to be broken and the victim recovers. *Solidago Canadensis* makes an infusion curing fever. *Vaccinium Pennsylvanicum* roots make an infusion to cure the suppression of urine. The roots of *Epilobium angustifolium* make a poultice to cure boils. The infusion of leaves of *Ledum Groenlandicum* is a stimulant, is used as a tonic before labor; and the leaves are used against headaches. An infusion of *Polypodium vulgare* is said to be a cure for dyspepsia. The flower of *Ranunculus acris* is used against headaches. *Anemone cylindrica* and *A. multifida* are used also for the same purpose in the region of the Rocky Mountains. The leaves are reduced to snuff which cause tears and sneezing, followed by a sense of relief. *Actaea alba* is used by the Temiscaming Indians in menstrual disturbances. *Clintonia borealis* has a root which when grated into powder and added to the bait attracts bears to the traps from great distances. The bark of *Populus tremuloides* powdered and mixed with sugar is taken as a vermifuge. *Achillea millefolium* when fresh and green is good for burns. The gum from *Abies balsamea* is used for burns and abscesses. *Anaphalis margaritacea* is used as poultices on burns. If one places a stick of *Fraxinus Americana* in the stove, the juice oozing out of its ends is said to cure earaches.—*A. H. MacKay.*

1693. BURKILL, I. H. **Notes on Cola trees in the Economic Garden, Singapore.** Gardens' Bull. Straits Settlements 2: 74–86. *Fig. 1.* 1918.

1694. CREMATA, MERLINO. **Plantas medicinales populares.** [Popular medicinal plants.] Revist. Agric. Com. y Trab. 2: 153–155. *2 fig.* 1919.—Some medicinal uses commonly made of *Cissus sycioides* Lin. and *Cajanus indicus* Lin., are discussed.—*F. M. Blodgett.*

1695. ANONYMOUS. **The economic resources of Burma cutch.** Chem. and Druggist 91: 705, 737.—The cutch of commerce is an extract prepared from several plants but its chief source is the wood of *Acacia Catechu*, native of India and Burma. This extract is also known as black catechu, Pegu cutch and Terra Japonica. Trees of a circumference of three feet or more are used; the bark is removed and used locally for tanning; the wood chipped by hand labor, the chips packed in earthenware jars covered with water and boiled. As the liquor thickens it is strained into other vessels and evaporated by heat until the extract will harden on cooling. The best grade is formed into blocks covered with large leaves; a poorer grade is poured into mats molded in the sand. Cutch has been used in Burma from time immemorial as a dye, for tanning and extensively to toughen fish lines, nets and canvas exposed to water. It has been exported for eighty years, and in 1915 the exports were 8526 tons. During the war the exports have markedly fallen off. As the forestry department of Burma is so greatly undermanned, the huge reserve forests are suffering many depredations and it is estimated that 15,000 cutch trees are illegally cut annually.—*E. N. Gathercoal.*

ANATOMY

1696. ANONYMOUS. [Rev. of: MALMANCHE, L. A. **Contribution à l'étude anatomique des Eriocaulonacées et des familles voisines: Restiacées, Centrolépidacées, Xyridacées, Philadracées et Mayacacées.** (Contributions to the anatomical study of the Eriocaulonaceae and related families: Restiaceae, Centrolepidaceae, Xyridaceae, Philydraceae and Mayacaceae.) Thesis for deg. Dr.Sc. Girault: St. Cloud (Paris), 1919.] Bull. Sci. Pharm. 26: 297. 1919.

1697. STYGER, JOS. **Beiträge zur Anatomie der Umbelliferenfrüchte.** [Contributions on the anatomy of umbelliferous fruits.] Schweiz. Apoth. Zeitg. 57: 125–126, 143–145. *Fig. 10–12.* 1919.—The fruit of *Berula angustifolia* Koch is rounded, laterally compressed, with the stylar cushion, both of the bent styles and a short 5-pointed calyx evident, 2 mm. long, 2 mm. deep and 1 mm. broad, dark-brown to yellowish-brown. The vittae form an almost closed

ring, two neighboring vittae sometimes being fused together. *Athamanta cretensis* L. fruit is elongated, grayish-brown, tomentose, crowned with a collar-like stylopodium and the long curved styles, 5 mm. high, 1.5 mm. deep, and 1 mm. broad. The ribs are not noticeable and the cremocarp not readily separable into its component mericarps. Two or three, seldom one, vittae are found in the ground tissue of the mesocarp between each 2 ribs. In the primary ribs outside of the fibrovascular bundle lie one, two or three small secondary oil reservoirs. The cells of the mesocarp contain a yellowish substance. The outer epidermis contains numerous hesperidin crystals of rosette, plumose or fine needle types. [See also next following Entry, 1698.]—*Heber W. Youngken.*

1698. Styger, Jos. **Beiträge zur Anatomie der Umbelliferenfrüchte. [Contributions on the anatomy of umbelliferous fruits.]** Schweiz. Apoth. Zeitg. 57: 183–188. *Fig. 13–15.* 1919.—The macro- and micro-morphological characteristics of the fruits of *Oenanthe Phellandrium* Lam., *Aethusa Cynapium* L., and *Levisticum officinale* Koch are considered together with the habitats of the plants yielding them. *Oenanthe Lachenalii* Gmel. fruits show thick walled wood parenchyma only in the ribs. The sclerenchyma fibers are arranged as in *O. Phellandrium.* In *Oenanthe pimpinelloides* fruits the sclerenchyma plates are more broadly developed in the ribs than in *O. Phellandrium*, but are extended over the vittae in a more layered band up to four cell rows broad. [See also next preceding Entry, 1697.]—*Heber W. Youngken.*

1699. Van Wisselingh, C. **Bijdragen tot de Kennis van de zaadhuid. Derde bijdrage: Over de zaadhuid der Papaveraceen en Fumariaceen. [Contributions to the knowledge of seed-coats. Third contribution: About the seed-coats of the Papaveraceae and Fumariaceae.]** Pharm. Weekblad 56: 849–865. *Pl. 1, fig. 5.* 1919.

ADULTERATION AND PHARMACO-ANALYSIS

1700. Gathercoal, E. N. **Couch grass versus Bermuda grass.** Jour. Amer. Pharm. Assoc. 8: 26–32. *Fig. 1–8.* 1919.—A historical, morphological, chemical and therapeutical discussion of *Agropyron repens* and *Capriola Dactylon*, with bibliography.—*Anton Hogstad, Jr.*

1701. Zufall, C. J. **The structure of Bermuda grass compared with that of triticum.** Jour. Amer. Pharm. Assoc. 8: 472–473. *Fig. 1–2.* 1919.—A comparison of the structure of Bermuda grass (*Capriola Dactylon*) with that of triticum (*Agropyron repens*). The dried rhizome of *Capriola* is seldom less than 2, and usually 3 mm., or more in diameter, and is usually hard and brittle, whereas triticum is seldom more than 2 mm. in diameter and usually soft and pliable. A marked difference is noted in the cortex, that of Bermuda grass being about one-fourth as broad as that of triticum and containing only 1 or 2 vascular bundles, whereas the cortex of triticum contains 6 or 7 bundles. Endodermis is absent in Bermuda grass, pith is four or five times as broad as that of triticum. In Bermuda grass there are from 30 to 35 bundles scattered throughout the pith, while in triticum there are only 10 or 12. Powdered Bermuda grass exhibits a large amount of starch and the powder is also characterized by the absence of endodermal cells.—*Anton Hogstad, Jr.*

1702. Ewing, Clare Olin, and Joseph F. Clevenger. **Ballota hirsuta, Benth. An adulterant of horehound (Marrubium vulgare L.).** Jour. Amer. Pharm. Assoc. 8: 273–275. *Fig. 1–2.* 1919.—A morphological study of *Marrubium vulgare*, *Ballota hirsuta* and *Ballota acetabulosa*, to aid in the identification of the materials offered for entry as "horehound," over which a great deal of confusion has arisen during the past two years. The following are the distinguishing characteristics: The calyx of true horehound, which is only about half as large as those of *Ballota acetabulosa* and *Ballota hirsuta*, is tubular, whereas the calyx of both *Ballota* species is nearly funnel-shaped. The calyx of *Ballota acetabulosa* has 10–20 obtuse lobes, which are crenate, whereas the marginal lobes of *Ballota hirsuta* are dentate. The leaves of *Marrubium vulgare* are tufted and usually curved or bent and sessile, whereas those of *Ballota hirsuta* are usually straight and are somewhat elevated by a multicellular basal stalk.—*Anton Hogstad, Jr.*

1703. YOUNGKEN, H. W. **Ballota hirsuta, a recent adulterant for Marrubium vulgare.** Amer. Jour. Pharm. 91: 147–156. *Fig. 1–9.* 1919.—A report on the examination of a shipment labeled "horehound herb" that had been sent from a Greek port to a Philadelphia firm but which had been condemned by the government on the ground that it contained an adulterant. Examination showed shipment to contain "*Ballota hirsuta.*" The macroscopical and microscopical characteristics of both *Marrubium vulgare* and *Ballota hirsuta* are fully discussed and are shown in a series of photographs and sketches.—*Anton Hogstad, Jr.*

1704. KNAPP, A. W. **The separation and uses of cacao shell.** Amer. Jour. Pharm. 91: 107–112. 1919.—An account of the method of separation and uses of cacao shells. The author states that the world production of cacao shell is found to be about 36,000 tons per year, of which Europe consumes 22,000 tons, the consumption in Great Britain being 4773 tons. Analyses of the roasted and unroasted shell and a discussion of the price of cacao shell are also given. (Reprinted from Jour. Soc. Chem. Ind., July, 1918.)—*Anton Hogstad, Jr.*

1705. ANONYMOUS. **Japanese chiretta.** Chem. and Druggist 91: 733. 1919.—Under this name a new substitute for Indian chiretta was offered at a recent drug sale in London. It is used in Japan in medicine as a bitter tonic, and was described in a list of Japanese drugs received from Japan by the late Mr. Thos. Christy in 1879. In Japan it is known as toyaku or semburi. The plant is about a foot high and bears some resemblance in foliage to *Erythraea Centaurium*, with flowers somewhat like those of *Chlora perfoliata*, but having pinkish-white flowers striped with purple. It is interesting botanically on account of the stigma being prolonged downwards over the edges of the valves of the ovary, whence the name given by Grisebach, *Pleurogyne rotata*. MATSUMURA in his "Index Plantarum Japonicarum" (p. 503) places it under *Swertia Chinensis*, and gives as synonyms *Pleurogyne rotata* and *Ophelia diluta*. The plant is widely spread in Japan and there are eleven other Japanese species of the genus *Swertia*. The drug is reported to be more bitter than the Indian chiretta. So far as pharmacy is concerned, the short stature of the plant and the larger prominent flowers will serve to distinguish it easily from the Indian drug.—*E. N. Gathercoal.*

1706. CLAASSEN, EDO. **Examination of a sample of gum asafoetida.** Amer. Jour. Pharm. 91: 164. 1919.—The author reports that a sample of gum asafoetida in which whitish, shining specks could be seen contained 54.45 per cent of gum, 35.51 per cent of calcite and 10.04 per cent of granite, the adulteration representing nearly half of the quantity of gum. Author also reports that the adulteration of another piece of gum, previously examined, consisted of calcite only in about the same amount.—*Anton Hogstad, Jr.*

1707. SCOVILLE, W. L. **Scammony and its substitutes.** Amer. Jour. Pharm. 91: 388–389. 1919.—A report on the examination of a sample of *Resina drastica*, a Mexican plant which closely resembles the Mexican Scammony, *Ipomoea orizabensis*. Examination of the *Resina* resin disclosed the fact that this product is far different from the resin of Mexican Scammony. A comparison is given of the resin of Scammony, resin of Mexican Scammony and the resin of *Resina drastica*, in tabulated form. (Reprinted from Jour. Ind. and Engin. Chem., April, 1919.)—*Anton Hogstad, Jr.*

1708. HOLMES, E. M. **Strophanthus semina, B. P.** Amer. Jour. Pharm. 91: 248–250. 1919.—Author sets forth the danger involved in the use of the preparations of Strophanthus seeds owing to the admixture of other seeds with the crude drug, and states that, in case of such powerful drugs as *Strophanthus, aconite* and *Digitalis*, the Foods and Drugs Act should be strictly applied to punish those using adulterated or mixed samples, or that a government inspector of vegetable drugs should be appointed to prevent such important remedies, if adulterated or diluted with other species, from entering commerce. A discussion of similar dangers regarding aconite follows, with the suggestion that the tincture of *Aconitum Napellus* should be prepared from the fresh plant, grown in Great Britain and collected in May. (Reprinted from Pharm. Journ. Pharmacist, Jan., 1919.)—*Anton Hogstad, Jr.*

1709. Farwell, Oliver A. **Cramp bark, highbush cranberry.** Northwestern Druggist 27: 245–246. 1919.—The commercial history of the drug Cramp bark is given and it is shown that no substitution of mountain maple bark for that of highbush cranberry was ever made but that, on the other hand, the mountain maple bark, from the very earliest times down to 1913, was the only commercial Cramp bark known. The opinion is expressed that the name Cramp bark, because of long years of use and commercial application, should be retained for the bark of *Acer spicatum* Lam. and the more familiar name of highbush cranberry should be adopted for the bark of *Viburnum Americanum* Mill. The paper is concluded by a letter from John Uri Lloyd, giving a detailed account of how the early Eclectics obtained their drugs through special collectors rather than from the commercial drug markets of the country, and presenting other remarks covering the Cramp bark and highbush cranberry subject.—*Oliver A. Farwell.*

1710. Bruntz, L. **Apropos de la presence des spores de Tilletia Tritici dans les selles.** [The presence of the spores of Tilleta Tritici in stools.] Bull. Sci. Pharm. 26: 257–265. *Fig. 1.* 1919.—Feces containing the spores were found. The spores apparently had been introduced into the stomach by spoiled bread or flour, and had passed unchanged into the intestinal tract. The spores can easily be distinguished from pollen grains and the eggs of helminths. Whether or not they are detrimental to man has not been established as yet.—*H. Engelhardt.*

PLANT CHEMISTRY

1711. Anonymous (R. Wz.). [Rev. of: Hug [Enrique, L. J. A.] **Le Cestum Parqui (Duraznillo negro); étude de propriétés physiologiques.** [Cestum Parqui (Duraznillo negro). A study of its physiological properties.] Thesis for the degree of doctor of veterinary medicine, University of Buenos Aires. Bossio and Bigliani, publishers, Buenos Aires, 1918.] Bull. Sci. Pharm. 26: 340. 1919.

1712. Babington, F. W., Alfred Tingle, and C. E. Watson. **The examination of commercial dextrin and related starch products.** Amer. Jour. Pharm. 91: 50–53. 1919.—Method for determining the amount of dextrin gum in a mixture of starch and dextrin gum, the starch being estimated by difference. A suggested method for examination of starch products is given which will meet most commercial requirements.—*Anton Hogstad, Jr.*

1713. Bourquelot, Em., and M. Bridel. **Application de la méthode biochimique à l'étude de plusieurs espéces d'Orchidées indigénes. Découverte d'un glucoside nouveau, la loroglossine.** [Application of the biochemical method to the study of various species of native orchids. Discovery of a new glucoside, Loroglossin.] Jour. Pharm. et Chim. 20: 81. 1919.

1714. Bourquelot, Em., and H. Hérissey. **Application de la méthode biochimique à l'étude des feuilles fraiches d'Hakea laurina. Extraction de québrachite et d'arbutine.** [The biochemical method applied to the study of the fresh leaves of Hakea laurina. Extraction of quebrachit and arbutin.] Jour. Pharm. et Chim. 19: 251–255. 1919.

1715. Bridel, M. Marc. **Application de la méthode biochimique aux rameaux et aux ecorces de diverses especes du genre Populus.** [Application of the biochemical method to the branches and barks of various species of the genus Populus.] Jour. Pharm. et Chim. 19: 429–434; 20: 14–23. 1919.

1716. Castro, R. de. **Propiedades medicinales del jugo del platanero.** [Medicinal properties of the juice of the plantain.] Revist. Agric. Com. y Trab. 2: 63–64. 1919.—Compilation of medicinal uses of the juice of the leaves and stems of the banana or plantain.—*F. M. Blodgett.*

1717. CROSSLEY, T. LINSEY. **Melting point of rosin.** Amer. Jour. Pharm. 91: 183–185. 1919.—A comparison of the "film," "capillary" and "column" methods for the determination of the melting point of rosin, with directions for each method. The results show, as the authors state, that, properly speaking, rosin, like asphalt, has no definite melting point, therefore, any specification aiming to grade it by reference to its behavior on heating should state the method for obtaining results. (Reprinted from Jour. Indust. and Engin. Chem., January, 1919.)—*Anton Hogstad, Jr.*

1718. DETHOUARS, G. O. A. **Aqua Laurocerasi uit verschillende variëteiten van Prunus Lauracerasus. [Cherry-laurel water made from different varieties of Prunus laurocerasus.]** Pharm. Weekblad 56: 790. 1919.—The author found the statements of Bridel, Juillet and Wester, that the young leaves contain the largest amount of hydrocyanic acid, correct, but he further found that the quantity of acid varies considerably with the different species of cherry-laurel. Thus, common *laurocerasus* contains 0.7 per cent; *l. Schipkaensis*, 1.46 per cent; *l. Schipkaensis Zabeliana*, 0.61 per cent; *l. Schipkaensis Michiana*, 0.62 per cent; *l. Schipkaensis Serbica*, 1.08 per cent; *l. Caucasica*, 1.05 per cent; *l. Colchica*, 1.36 per cent; *l. latifolia Bertini*, 0.7 per cent; and *l. rotundifolia*, 1.2 per cent.—*H. Engelhardt.*

1719. DOX, ARTHUR W., AND G. P. PLAISANCE. **A new method for the determination of vanillin in vanilla extract.** Amer. Jour. Pharm. 91: 167–170. 1919.—A brief résumé of the various methods for the determination of vanillin, with an account of the use of thiobarbituric acid in the presence of 12 per cent of hydrochloric acid for this purpose. In summarizing the authors state "Thiobarbituric acid, which is easily prepared from malonic ester and thiourea, may be used for the quantitative determination of vanillin in vanilla extracts which do not contain caramel as added coloring matter. When caramel is present it may easily be detected by the brown precipitate formed on the addition of phloroglucinol to the clarified extract containing 12 per cent of hydrochloric acid. (Reprinted from Simmon's Spice Mill, November, 1918.)—*Anton Hogstad, Jr.*

1720. FINDLAY, DOROTHY F. **An iodine factory in eastern Siberia.** Amer. Jour. Pharm. 91: 245–248. 1919.—An interesting account of a visit to a little iodine factory about 200 miles from Vladivostok. The author describes in a popular manner a tour through the factory where iodine is manufactured along simplest possible lines. "Chinese junks go out and rake in the seaweed, which is carried up to the top of the beach, stacked in piles, and burnt on the spot, at a stone's throw from the factory. The ash is wheeled straight into the tanks, lixiviated with the water in the usual way." There are many points of interest as to villagers, methods of transportation, etc. (Reprinted from the Pharm. Journ. and Pharmacist, Jan., 1919.)—*Anton Hogstad, Jr.*

1721. GÉRARDIN, E. **Le Ladanum appelé aussi Ambre noir et Baume noir. [Ladanum also called black amber and black balsam.]** Bull. Sci. Pharm. 26: 289–297. 1919.—Data on the origin of the drug, the etymology of its name, the chemical composition of the balsam, an account of the substances used for adulterating the drug and of the use of the balsam, are given.—*H. Engelhardt.*

1722. JACOBSON, C. A. **Alfalf saponin. Alfalf investigation VII.** Jour. Amer. Chem. Soc. 41: 640–648. 1919. [See Bot. Absts. 3, Entry 1223.]

1723. KOCH, GEORGE P. **The influence of the presence of stems and roots upon the total alkaloid content of the leaves of stramonium.** Amer. Jour. Pharm. 91: 11–16. 1919.—In order to determine the possibilities and advisabilities of utilizing the stems and roots of stramonium in conjunction with the leaves, the author sets forth the results of his experiments in a series of 4 tables, which, briefly summarized, are as follows: (1) Moisture determinations of various parts of the plant: Leaves, 80–85 per cent; secondary stems, 87–92 per cent; primary stems, 85–87 per cent; roots, 78–82 per cent. (2) Relation of the leaf to that of stems: 47.5–52.5 per cent. (3) Relation of the leaf to that of stems and roots: 41 per cent. (4) Total alkaloid

content of various parts and the results produced when various percentages of stems and roots were added to the leaves: Leaf and secondary stems or leaves with 10 per cent of secondary stems are much higher than the required U. S. P. content. That the whole plant, with or without the root, can be used for a commercial preparation that will meet the desired standard of 0.25 per cent of total stramonium alkaloids.—*Anton Hogstad, Jr.*

1724. Lynn, E. V. **Ozonides and peroxides of the terpenes as therapeutic agents.** Jour. Amer. Pharm. Assoc. 8: 103–104. 1919.—The view that oxygenated constituents of the volatile oils are the bearers of therapeutic properties, whereas the terpenes are regarded as mere diluents and hence of little value, has been shattered by a study of the products resulting from the oxidation of the terpenes with either atmospheric oxygen or ozone. The products of the action of ozone on the terpenes are termed ozonides and those resulting from the action of atmospheric oxygen on unsaturated hydrocarbons are called peroxides. Emphasis is placed on the necessity for further study of the chemical products that result from the initial addition of oxygen to the terpenes and the subsequent rearrangements of the labile oxides, both ozonides and peroxides.—*Anton Hogstad, Jr.*

1725. Lynn, E. V. **Camphene in hemlock oil.** Jour. Amer. Pharm. Assoc. 8: 104. 1919. —Brief report on the identification of camphene in hemlock oil, the identity of which was established by converting it into borneol, m.p. 204°, by the Bertram-Walbaum hydration reaction.—*Anton Hogstad, Jr.*

1726. Miller, E. R., and E. V. Lynn. **Oleoresin of Pinus ponderosa.** Jour. Amer. Pharm. Assoc. 8: 103. 1919.—A preliminary note on the examination of the oil obtained from the oleoresin of *Pinus ponderosa* by steam fractionation, to determine its constituents as well as to isolate the nopinene. Results to be reported elsewhere.—*Anton Hogstad, Jr.*

1727. Partridge, William. **Note on the assay of red Cinchona bark.** Amer. Jour. Pharm. 91: 382–383. 1919. [Reprinted from The Analyst, March, 1919.]—Author reports that unsatisfactory results have been obtained in the assay of *Cinchonae rubrae cortex B. P.*, 1914, and suggests that there be a reduction in the amount of water used, making it 12 mils of water instead of 22 mils for the 10 grams of powdered drug. By using this proportion of water, higher contents of total alkaloids were obtained on three occasions, the increases being respectively 2.02, 1.16 and 1.46 per cent above the amounts found when pharmacopoeial instructions were followed.—*Anton Hogstad, Jr.*

1728. Phillips, Max. **An unusual oil from Monarda punctata.** Jour. Amer. Pharm. Assoc. 8: 177–179. 1919.—The oil contains hydrothymoquinone and the plant resembles Monarda fistulosa in its phyto-chemical constituents.—*Anton Hogstad, Jr.*

1729. Phillips, Max. **The Volatile oil of Canada balsam.** Jour. Amer. Pharm. Assoc. 8: 175–179. 1919.—A preliminary investigation of the volatile oil of Canada balsam, in which the presence of pinene has been confirmed. There is at least one other terpene present, as indicated by the boiling-points of certain fractions and by the benzylamine base of the fraction obtained at 173–178°C.—*Anton Hogstad, Jr.*

1730. Posternak, S. **Sur deux sels crystallisés du principe phospho-organique de réserve des plantes vertes.** [Two phospho-organic salts in the reserve of green plants.] Compt. Rend. Acad. Sci. Paris 168: 1216–1219. *1 fig.* 1919.

1731. Power, Frederick B., and Victor K. Chesnut. **Ilex vomitoria as a native source of caffeine.** Jour. Amer. Chem. Soc. 41: 1307–1312. 1919.—*Ilex vomitoria* contains a large amount of caffeine and no other North American species of *Ilex* contains this substance; nor is it found in the European holly (*Ilex aquifolium* Linné.).—*J. M. Brannon.*

1732. Schaefer, Hugo H. **Some variations in Cinchona bark and its preparations.** Jour. Amer. Pharm. Assoc. 8: 11–13. 1919.—Report on the examination of several Cinchona barks, samples of fluid extracts of cinchona and tinctures of cinchona, which meet the requirement

for total alkaloid content of U. S. Pharmacopoeia IX but which fail to meet the ether-soluble requirement of U. S. P. VIII, thereby showing a deficiency in quinine content. Author voices the opinion that it would be much better to have requirements for both total and ether-soluble alkaloids for cinchona and its preparations.—*Anton Hogstad, Jr.*

1733. WAKEMAN, NELLIE. **Teaching plant chemistry.** Jour. Amer. Pharm. Assoc. 8: 105–108. 1919.—See Bot. Absts. 3, Entry 922.

1734. WUNSCHENDORFF, H. E. **L'huile de fenugrec.** [Oil of fenugreek.] Jour. Pharm. et de Chim. 19: 397. 1919.—In addition to a volatile oil, fenugreek contains 7 per cent of a golden-yellow, drying, fatty oil which is soluble in all proportions in ether, petroleum ether and carbon disulphide but incompletely soluble in absolute alcohol and acetone. Chemical and physical constants are given.—*H. Engelhardt.*

POISONOUS PLANTS AND INSECTICIDES

1735. HOFFMAN, J. A. **Mercurialis poisoning in horses.** Berliner Tierarzt. Wochenschr. [through Pharm. Jour. 102: 426. 1919].—The question of Mercurialis poisoning was discussed by the author in 1918, when he described 8 cases of horses which had eaten hay containing great quantities of *Mercurialis annua*. The animals were affected in varying degrees; two recovered in three days; two others after 2 and 3 weeks, respectively. One of the eight died in 24 hours with symptoms of acute colic. Mercurialis preserves its toxicity even when dried. Some animals show a strange predisposition to the toxic action of the plant; others are much more resistant. According to Schulz, the toxic principle is mercurialin, which acts upon the muscles and the nerves of the intestine and the bladder, and also upon the heart. The red tint of the urine is attributed to an indigo-red pigment contained in the plant.—*E. N. Gathercoal.*

1736. LEWIN, LOUIS. **Pfeilgifte und Pfeilgiftwirkungen.** [Arrow poisons and their effects.] Naturwiss. 7: 181–186. 1919.—A condensed account is given of over 40 years' study of this group of poisons, mostly of plant origin. The poisons are considered as they affect the animal system; first, local inflammatory poisons, then those that cause general symptoms of poisoning, these last being divided into (a) respiratory poisons, (b) heart poisons, (c) those producing cramps, and (d) those producing paralysis.—*Orton L. Clark.*

1737. ROARK, R. C. **Plants used as insecticides.** Amer. Jour. Pharm. 91: 25–37, 91–107. 1919.—A contribution from the Insecticide and Fungicide Laboratory, Miscellaneous Division, Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C., calling the attention of entomologists, pharmacists and others to some 175 plants that might be utilized as insecticides to replace the arsenicals, pyrethrum (insect powder) and others. The author also states some possible uses of these, assuming no responsibility for the statements but merely quoting from various authors, with the hope that some of the plants listed may be found to be of commercial value as insecticides.—*Anton Hogstad, Jr.*

PHYSIOLOGY

B. M. DUGGAR, *Editor*

PROTOPLASM, MOTILITY

1738. HARPER, R. A. **The structure of protoplasm.** Amer. Jour. Bot. 6: 273–300. 1919.—See Bot. Absts. 3, Entries 1934, 2133.

1739. KNUDSEN, L. **Viability of detached root-cap cells.** Amer. Jour. Bot. 6: 309–310. 1919.—Contrary to the prevailing belief that root-cap cells die as they are sloughed off, the author finds that in corn and Canada field peas grown in water cultures these cells, dropping off and collecting on the bottom of the culture vessels, remain alive for a long period (45 to 50 days or more).—*E. W. Sinnott.*

1740. Weber, Friedl. **Die Plasmaviskosität pflanzlicher Zellen. [Review of recent work on the viscosity of the protoplasm of plant cells.]** Zeitschr. Allg. Physiol. (Referate) 18¹: 1–20. 1918.—Two methods of determining the viscosity of protoplasm are described. The viscosity of the protoplasm of the starch-sheath cells of *Vicia faba* is 23 times that of pure water. The viscosity decreases with rising temperature, the temperature coefficient being the same as for albumen, lying between 1.51 and 1.27. At extremely high temperatures a decided increase in viscosity occurs ("Wärmestarre"). One to 5 per cent ether decreases the viscosity, 5 to 10 per cent increases it. Small amounts of aluminium salts markedly increase the viscosity. Long immersion of sections in water decreases the viscosity, which rises near the time of death. Wounding increases the viscosity. Mechanical shaking decreases the viscosity, stronger or longer continued shaking increases it. A discussion of the relation of the influence of gravity on viscosity and geoperception is given.—*William J. Robbins.*

WATER RELATIONS

1741. Sayre, J. D. **Comparative transpiration of tobacco and mullein.** Ohio Jour. Sci. 19: 422–426. 1919.—In this preliminary paper the following conclusions are given: Mullein leaves offer greater resistance to water-loss in darkness than in light, and less in wind than in still air. They are as responsive to environmental changes as tobacco leaves. The removal of the hairs from mullein leaves affects cuticular transpiration only. In the course of a day, water-loss is first accelerated by the increased diffusion gradient through the opened stomata. At midday this becomes counterbalanced by leaf-water deficit and decreasing stomatal pores. Eventually the diffusion gradient decreases and the night rate is reached before the stomata are fully closed. Autonomic transpirational rhythm was observed in certain cases when plants were left in darkness for a day. The conditions controlling this rhythm are described. [See also next following Entry, 1742.]—*H. D. Hooker, Jr.*

1742. Sayre, J. D. **Factors controlling variations in the rate of transpiration.** Ohio Jour. Sci. 19: 491–509. *Fig. 1–9.* 1919.—Experiments to determine the factors controlling transpiration and its rhythm in darkness in *Verbascum thapsus* and *Nicotiana* sp. are described. Temperature and humidity were recorded by a hygrothermograph, checked by a psychrometer. Evaporation rates were determined by porous-cup atmometers. Transeau's automatically recording apparatus was used to determine rates of water-loss from the plants. The size of the stomatal pores was measured by Lloyd's method, after fixation in absolute alcohol. Transpiration at night is entirely cuticular. The day rate is controlled by the following factors: stomata, leaf-water deficit, and diffusion gradient. These factors combine to give a rounded curve. Tobacco and mullein show a rhythm in the transpiration curve in total darkness on a day following normal light conditions. This is absent on the second day, and was not found on the first day in *Verbascum blattaria.* The cause of the rhythm is thought to be stomatal activity. [See also next preceding Entry, 1741.]—*H. D. Hooker, Jr.*

MINERAL NUTRIENTS

1743. Miller, H. G. **Relation of sulphates to plant growth and composition.** Jour. Agric. Res. 17: 87–102. *Pl. 9–12.* 1919.—See Bot. Absts. 3, Entry 1770.

PHOTOSYNTHESIS

1744. Spoehr, H. A. **The carbohydrate economy of cacti.** Carnegie Inst. Washington [D. C.] Publ. 287. *79 p., fig. 1–2.* 1919.—Sugars are the first products that accumulate in the process of photosynthesis of carbon compounds and are considered the starting point for the synthesis of other compounds in all living matter. The tissues of cacti behave like masses of gels composed largely of colloidal carbohydrates among which are large quantities of pentosans. Organic compounds containing hydroxyl groups (e. g., carbohydrates) are very weak acids and while the sugars are stable substances, their salts decompose very readily, resulting

in mixtures of great complexity. The cleavage products are unstable and highly reactive. Many reactions take place giving a large number of substances in varying amounts depending on the concentration of sugar, temperature, oxygen supply, etc. With ample water supply and O_2 the hexoses are burned so that there is no accumulation of end products. The organic acids found in succulents are the accumulating intermediate or end products of catabolism. These organic acids break down easily in sunlight, i. e., split off CO_2. Joints of *Opuntia tersicolor* and *O. phaeacantha* were the material used. The work consists largely of analyses of these plants taken under a variety of external conditions and subjected to a number of experimental conditions. Owing to the mucilaginous character of the material special methods of analysis were necessary, and serious errors were found in existing methods applied to plant material. The material must be quickly dried in order to destroy at once all enzyme actions which by the usual methods of drying are greatly accelerated for some time by the heat before the material is killed. One per cent HCl for hydrolysis proved best. This completely hydrolyzes polysaccharides, its effect on cellulose is slight, much less than other mineral acids. In making alcohol extractions it is exceedingly important that the plant acids be neutralized with $CaCO_3$, the addition of alkalies, e. g., NH_4OH as commonly used, leading to molecular rearrangements. A study of various methods of determining pentoses showed that these were open to serious sources of error and can be determined with accuracy only after removal of hexoses by fermentation. A special method was devised for use with alkaline copper solutions for all reducing sugars. Soxhlet's modification of Fehling's solution was used throughout. Reduction is carried out under precise conditions in a centrifuge tube of special design graduated on neck and provided with glass stopper. After reduction is completed, the tube is cooled and the solution made up to volume and thoroughly mixed. The tube is then centrifuged, which results in the compact sedimentation of all CuO and foreign matter. The supernatant liquid is perfectly clear and the remaining Cu can be accurately determined by means of the thiosulfate method according to Peters (Jour. Amer. Chem. Soc. 34: 928–954; 422–454. 1912). Analyses embrace dry weight, total sugars, total polysaccharides, total hexose sugars, hexose polysaccharides, disaccharides, monosaccharides, hexoses, total pentose sugars, pentosans, pentoses, cellulose, ash, and some micro-chemical tests on starch formation and consumption. From these data conditions of equilibrium of the various components are determined. Starch could not be determined by taka-diastase because of the protective action of the mucilaginous substances. Rate of emission of CO_2 was determined by absorption of CO_2 in standard $Ba(OH)_2$ solution and titrating unchanged base with standard HCl solution, using methyl orange. Joints 4 to 6 of cactus were hermetically sealed in a light-proof desiccator provided with entrance and exit tubes, which was immersed in a thermostat. CO_2-free air was drawn through the apparatus by an electric pump, pressure being regulated by a Palladin regulator for 4 to 12 hours and the stream of air could be passed through a fresh tube without interrupting the experiment. Individual plants show considerable variation in all components depending upon their location and environmental conditions. The major portion of the carbohydrates is present as polysaccharides, mainly as starch and a mucilaginous substance of pentosan nature. Results of analyses of *O. tersicolor* and *O. phaeacantha* gave fairly comparable results, with the total carbohydrate content, and generally that of each constituent, higher in the last named species. The following individual sugars were identified: l-xylose, d-glucose, fructose, saccharose, also glucuronic acid in small amount. The mucilaginous substances which play an important physiological rôle were obtained by extraction with water filtered through fine silk repeatedly, and precipitated with alcohol and dried. It was found by hydrolysis to contain 34.1 per cent d-glucose and 65.9 per cent l-xylose, and a small amount of ash. It has an enormous water holding power, though this does not prevent transpiration. The following seasonal variations in carbohydrate content were observed. Low water content and high temperature are associated with: (1) increase of polysaccharides; (2) decrease of monosaccharides; (3) increase of pentosans. High water content and low temperature with: (1) decrease of polysaccharides; (2) increase of monosaccharides; (3) decrease of pentosans. The greatest activity of the plant comes at the time when the content of mono- and disaccharides is highest, and a supply of simple sugars above that required for the normal respiratory activity seems

be one of the factors necessary for growth. Series of experiments in which either the temperature or water conditions were altered show that low water content and high temperature affect the carbohydrate equilibrium in the same direction, and in reverse manner as related to high water content and low temperature, as just indicated.—In dry seasons loss of water and resultant need of water by the plant causes condensations of monosaccharides and disaccharides into polysaccharides and pentosans. Water is also formed by oxidation of simple sugars in respiration. Simple sugars quickly disappear when the plant undergoes natural or artificial slow desiccation. These plants can continue to live for a long time without water or formation of food and with but slight change in the per cent of water. These plants were kept at 28°C. in the dark for 189 days, they lost over 60 per cent in weight, and the water-content was reduced by but 12 per cent. The carbohydrate metabolism under these conditions is also treated.—The nocturnal respiration of cacti is characterized by the formation of acids due to restricted oxygen supply. No accumulation of alcohol was found during the night but a distinct increase was observed after the plants had been exposed to sunlight for some time, probably due to disintegration of malic acid:

$$COOH \cdot CH_2 \cdot CHOH \cdot COOH \rightarrow 2\ CO_2 + CH_3 \cdot CH_2OH$$

Under anaerobic conditions there is a very active production of alcohol but little acid formation in cacti. Under these conditions there is also higher rate of carbohydrate consumption and water formation than in air. The plants do not go into a condition of dormancy when the water supply is greatly diminished, but continue their normal respiratory activity, this being possible by virtue of their ability to use as food material not only the simple monosaccharides but also the polysaccharides, and results in the formation of pentosans. The simpler sugars, or monosaccharides, decrease in amount in the plants as the water content is reduced, and, vice versa, an increase in water supply results in a relative increase in these sugars. Pentosan formation is also dependent upon the water-content of the plant. With continued low water content the pentosans increase decidedly, whereas an ample supply of water results in the reduction of the amount of pentosans. In the aldose monosaccharides the first carbon atom, or the carbonyl group (CH:O), is the most reactive and is largely responsible for the great reactivity of these sugars. In the disaccharides and polysaccharides found in these plants this active carbonyl group is so united with other groups that it no longer forms the point of attack in chemical reaction. These sugars are therefore first affected on the opposite end of the chain of carbon atoms, at the CH_2OH group. Such a reaction results in a primary formation of glucuronic acid. $CH:O\cdot(CH\cdot OH)_4COOH$. This substance has been found as a product of carbohydrate metabolism in animals, usually in the conjugated form. It has now also been found in the extract of cacti, though only in very small amounts. Its presence is especially significant in that it indicates the mode of pentose formation in these plants. A very general property of acids of this character is the loss of CO_2 in the sunlight, and conversion into the corresponding lower aldehyde. In this manner glucuronic acid would form l-xylose. Neuberg (Ergebnisse d. Physiol. 3: 373. 1904) has actually obtained l-xylose from glucuronic acid by bacteriological methods. Further evidence in favor of this interpretation of the formation of pentoses is obtained from the consideration of the structural relations of the various sugars concerned. If the pentoses were derived from the direct oxidation of the hexoses, d-glucose would yield d-arabinose, and d-galactose would give d-xylose. It is a striking fact, however, that d-glucose has almost always been found together with l-xylose, and d-galactose associated with l-arabinose. This is precisely what would be demanded by the theory of the intermediate formation of glucuronic acid.—*J. M. McGee.*

METABOLISM (NITROGEN RELATIONS)

1745. Fosse, R. **Le mécanisme de la formation artificielle de l'urée par oxydation et la synthèse des principes naturels chez les végétaux. [The mechanism of artificial formation of urea and the synthesis of substances in plants.]** Compt. Rend. Acad. Sci. Paris 168: 1161–1166. 1919.—The author finds that formaldehyde and hydrocyanic acid are intermediate products in the formation of urea. It is suggested that there may be some relation between the synthesis of urea and the synthesis of glucose in plants.—*V. H. Young.*

1746. GATIN, C.-L. **La maturation artificielle des fruits. [Artificial ripening of fruit.]** Jour. Agric. Tropic. 19: 256–260. 1919.—A brief review of the work of other investigators relative to the chemical changes taking place in the ripening of fruit, and of means devised for artificially ripening such fruit as the Japanese persimmon.—*J. D. Luckett.*

1747. HEYL, FREDERICK W. **The yellow coloring substances of ragweed pollen.** Jour. Amer. Chem. Soc. 41: 1285–1289. 1919.

1748. LEWIS, C. O. **Premature deterioration of fruit.** Better Fruit 13[1]: 5–7. Jan., 1919. —See Bot. Absts. 3, Entry 1642.

1749. POWER, FREDERICK B., AND VICTOR K. CHESNUT. **Ilex vomitoria as a native source of caffeine.** Jour. Amer. Chem. Soc. 41: 1307–1312. 1919.—See Bot. Absts. 3, Entry 1731.

1750. BEIJERINCK, M. W. **The significance of the tubercle bacteria of the Papilionaceae for the host plant.** Proc. Roy. Acad. Sci. Amsterdam 21: 183–192. 1918. [Also published under: **De beteekenis van de bakteriën der Papilionaceën knolletjes voor de voedsterplant.** Versl. K. Akad. Wetenschappen Amsterdam 26: 1456–1465. 1918.]—The author attempts to discredit the view that *Bacillus radicicola* either grown free or in nodules fixes nitrogen, and offers the hypothesis that the bacteria are only indirectly concerned, the implication being that the protoplasm of the host plant is the catalyst responsible for the fixation. The evidence is, in part, admittedly circumstantial. *Robinia pseudo-acacia* has few and small nodules, yet the author believes that much atmospheric nitrogen is fixed, and therefore the fixation by the few nodules must be at an enormous rate or else the nitrogen is fixed by the host plant.—Scarcity of nodules is reported for such shrubs as *Sarothamnus vulgaris, Spartium scoparium, Genista anglica,* and *Genista pilosa* growing in unfertile soils, and the author considers this as evidence for the fixation of nitrogen by the host.—Experimentally, the author reports no nitrogen fixation by the free bacteria. Fixation experiments were made with 100 grams to 1000 grams of nodules of yellow lupine. These were placed in wide glass tubes and kept from 12 to 20 days and then gas analyses made. Evidence for nitrogen fixation was obtained neither in this experiment nor when nodules on roots attached to portions of the stem were used.—Experiments were also made using 15 grams of nodules of *Robinia pseudo-acacia* and 10 to 20 grams of nodules of *Vicia faba* with like results.—*L. Knudson.*

1751. BLANCK. [Rev. of BLANCK, E. **Beiträge zum bakteriologisch-chemischen Umsatz der Milcheiweissstoffe, insbesondere Galalith, im Boden. (Contribution on the bacteriological chemical exchange on proteins of milk, especially galalith, in soils.)** Landw. Versuchsst. 90: 17. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 283–284. 1918.—See Bot. Absts. 3, Entry 1796.

1752. SPITZER, GEORGE, R. H. CARR, AND W. F. EPPLE. **Soft corn—its chemical composition and nitrogen distribution.** Jour. Amer. Chem. Soc. 41: 1212–1221. 1919.—The authors found the nitrogen content not greatly affected by the degree of maturity of soft maize. Considerable of the nitrogen is present as amide, and it seems to be formed at the expense of the zein. Glutelin seems to be the most abundant protein, zein next, and globulin last. "The amide or non-protein nitrogen content and the acidity in soft, moldy corn are quite high." Amide nitrogen may be taken as a basis for determining the maturity of maize.—*J. M. Brannon.*

METABOLISM (ENZYMES, FERMENTATION)

1753. MEYERHOF, OTTO. **Über den Zusammenhang von Atmung und Gärung. [On the connection between respiration and fermentation.]** Naturwissenschaften 7: 253–259. 1919.—The hypothesis, based on Pfeffer's and Pflüger's understanding of intramolecular respiration, that all respiration starts with anaerobic changes, that the metabolic products largely occur as alcohol when oxygen is absent, while these are oxidized further to carbon dioxide and water

in the presence of oxygen, has been proved in the case of certain plants; but it does not hold true with the animal cells studied. With the exclusion of oxygen from these no alcohol or carbon dioxide is formed. On the other hand, if one assumes that lactic acid may be an intermediate product of fermentation, as Büchner now thinks, we may hold to the identity of intramolecular respiration and fermentation, since lactic acid is found as a product of respiration in the animal cell (muscle) under both aerobic and anaerobic conditions. Meyerhof then shows how the respiratory enzymes have been separated from the life of the cell much as have the enzymes of fermentation. Co-enzymes have also been discovered in respiration, these playing a part similar to that of the co-ferments in fermentation.—*Orton L. Clark.*

1754. Went, F. A. F. C. **On the course of the formation of diastase by Aspergillus niger.** Proc. Roy. Acad. Sci. Amsterdam 21: 479–493. 1919. [Transl. from Versl. K. Akad. Wetensch Amsterdam 26 or 27: 1918.]—The paper is concerned with the amount of diastase present in the fungus and nutrient solution at varying ages of the culture. The nutrient solution was composed of 5 per cent glucose, 0.5 per cent NH_4NO_3, 0.1 per cent K_2HPO_4, and 0.05 per cent $MgSO_4$. The author finds that for the first few days after germination there is a very marked production of diastase in the mycelium, but after five days there follows a rapid destruction of the enzyme. Relatively little of the enzyme is found in the culture medium, and the author believes that this is derived from dead cells.—*L. Knudson.*

ORGANISM AS A WHOLE

1755. Pringsheim, Hans. **Die chemische Anpassung der Mikroorganismen.** [The chemical adaptation of the microörganisms.] Naturwiss enschaften 7: 319–323. 1919.—The remarkable ability of microörganisms to use as food practically all the substances occurring in nature is discussed. Pringsheim then notes how the more complex molecular organic compounds and their final decomposition products, which approach the elementary state, are used in the nutrition of only a few highly specialized microörganisms; while the substances which are intermediate in the breaking down of the carbohydrate and protein molecules (i.e., the sugars and peptones) serve as food for a very large variety of microörganisms. Special cases of adaptation of microörganisms to the use of various types of carbohydrates and proteins are considered. Reference is also made to the rôle of enzymes of the yeast cells as well as to the use of the chemotactic reaction of the motile microörganisms as a test of the food value of certain racemic substances for the organism.—*Orton L. Clark.*

GROWTH, DEVELOPMENT, REPRODUCTION

1756. Lewis, C. I. **Some interesting phases of the pruning problem.** Better Fruit 13[1]: 26–32. Feb., 1919.—See Bot. Absts. 3, Entry 1541.

MOVEMENTS OF GROWTH AND TURGOR CHANGES

1757. Alvarado, Salustio. **Sobre el verdadero significado del "sistema de fibrillas conductor de las excitaciones en las plantas" de Nemec. (Un dato para la historia del condrioma vegetal.)** [True significance of Nemec's system of filaments for conducting stimuli in plants.] Bol. R. Soc. Española Hist. Nat. 19: 147–152. *Fig. 1–2.* 1919.

TEMPERATURE RELATIONS

1758. Emeis, W. **Eine weitere Erklärung zur Bildung von Haareis auf morschem Holz** [A further explanation of the formation of hair-ice on decayed wood.] Naturwissenschaften 7: 124. 1919.—The appearance of this curious formation is due not to the coöperation of fungi as Wegener held, but to purely physical causes. The decayed wood is usually saturated with water and at low temperatures the water expands in the vessels and freezes in hair-like spindles as it exudes from them.—*Orton L. Clark.*

TOXIC AGENTS

1759. RITZEMA BOS, J. **Bijdrage tot de kennis van de werking der bordeauxsche pap op de aardappelplant.** [A contribution to the knowledge of the action of Bordeaux mixture on the potato plant.] Tijdschr. Plantenz. 25: 77–94. 1919.—See Bot. Absts. 3, Entry 1654.

MISCELLANEOUS

1760. ALVARADO, SALUSTIO. **La fina estructura de los vasos leñosos. (Nota previa.)** [Minute structure of wood vessels.] Bol. R. Soc. Española Hist. Nat. 19: 66–75. *Fig. 1–7.* 1919.—See Bot. Absts. 3, Entry 1567.

1761. BARSS, H. P. **Prune troubles of non-parasitic nature.** Better Fruit 13[1]: 7–8, 24–28 Jan., 1919.—See Bot. Absts. 3, Entry 1625.

1762. VAN DER LEK, H. A. A. **Ouer de z. g. "verwelkingsziekten," in het bijzonder die welke door Verticillium alboatrum veroorzaakt worden.** [Regarding the so-called wilt diseases especially those caused by Verticillium alboatrum.] Tijdschr. Plantenz. 24: 205–219. *Pl. 4 fig. 1–3.* 1918. *Ibid.* 25: 17–52. *Pl. 1–3, fig. 1–4.* 1919.—See Bot. Absts. 3, Entry 1666.

SOIL SCIENCE

J. J. SKINNER, *Editor*

GENERAL

1763. BEAUMONT, A. B. **Studies in the reversibility of the colloidal condition of soils.** Cornell Univ. Agric. Exp. Sta. Mem. 21: 480–524. 1919.—The author holds that soil colloidality is dependent to a considerable degree upon circumstances and environment. The colloidal condition of a soil is constantly changing being especially susceptible to moisture variations. Wetting and drying in its effect upon colloidal conditions is therefore the particular phase set forth in the present study.—In discussing the modern conceptions or reversibility as related to colloidal materials the author agrees with Oswald that the change is not determined in the main by the nature of the colloid itself but by the conditions that produce coagulation. The term reversibility as generally used, that is to indicate a change from the colloidal to non-colloidal state and vice versa, is found too narrow from the soil standpoint and is broadened to include the changes between the sol and gel states.—In reviewing the literature as to the effects of wetting and drying on soils, the physical changes which are set up seem in general to be correlated with increased fertility. Cohesion and plasticity for instance are generally reversed and most authorities attribute the commonly observed changes to alterations in the colloidality of the soil.—After an extended experimentation with methods the author selected three for use: (1) a modified Mitscherlich water-vapor-method, (2) a modification of Ashley's dye method and (3) the ordinary suspension procedure. The first two were used most extensively, the degree of hygroscopicity and the amount of dye absorbed being considered as relative measures of colloidal content. In general temperature variations below 10°C. did not noticeably affect water vapor absorption. Dyes were absorbed differently by soils according to the chemical character of the dye and the colloids present in the soil.—Hygroscopicity of soil was decreased by successive air-drying, oven-drying and ignition. The passage from the moist to air-dry state produced a greater colloidal change than from the air-dry to oven-dry condition. Ignition produced a marked effect although the hygroscopic values of some ignited soils were very high. Alternate wetting and drying had little effect upon surface soils after the first passage. Such action with subsoils was cumulative. Long immersion in water raised the hygroscopicity of a soil low in organic matter and lowered it in a soil rich thereof. Leaching seemed to increase the water vapor absorption of soils.—As the same general results were attained with the dye method of estimating colloidal content, the author concludes that the drying of a soil especially from the moist to

air-dry condition has a profound effect in reversing colloidal properties. The recovery from such a reversal is by no means immediate upon wetting but is comparatively slow. The influence of drying upon colloidal conditions seems to the author to be more or less indirect, the direct effects being produced by later chemical and biological actions.—*H. O. Buckman.*

1764. Lewis, C. I. **Correlation of orchard practices.** Better Fruit 13[3]: 17-22. *Tab. 1-8.* March, 1919. Nitrogen as sodium nitrate, applied at a rate of 3–5 pounds per tree proved to be best fertilizer for apples. Early spring application gave best results. [See Bot Absts. 3, Entry 2341.]—*J. J. Skinner.*

1765. Lipman, C. B., and W. F. Gericke. **The inhibition by stable manure of the injurious effects of alkali salts in soils.** Soil Sci. 7: 105–120. 1919.—By pot experiments in the greenhouse, barnyard manure was found to reduce or eliminate the toxic action of sodium chloride, sodium sulfate or sodium carbonate on barley plants. Four successive crops were grown. The salts were tested singly at the rate of 0.3 per cent each for sodium chloride and sodium carbonate, and 0.6 per cent for sodium sulfate, based on the dry weight of the soil. Previous to the second planting additional quantities of the salts were added at the same rate. It should be feasible and profitable to offset the inhibiting effects of the salts in some of the alkali land of the west by use of barnyard manure or other form of organic matter.—*William J. Robbins.*

1766. Main, F. [Rev. of: Fauchère, A. **Guide pratique d'agriculture tropicale.** *159 p.* Paris. Augustinn Challmel, 1918.] Jour. Agric. Tropic. 19 (Bull. Bibliog.): 127. 1919.—See Bot. Absts. 3, Entry 1379.

1767. Metge, G. [Rev. of: Clausen. **Die Bodenausnutzung durch die Kartoffel bei kleinen und grossen Saatknollen und bei enger und weiter Pflanzenzweite. (Utilization of the soil by the use of large and small seed potato tubers and by close and wide spacing.)** Illustr. Landw. Zeitg. 37: 108–109. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 285. 1918.—See Bot. Absts. 3, Entry 1385.

1768. Metge, G. [Rev. of Lemmerman, O., and H. Wiessmann. **Über die Wirkung einer humosen Braunkohle als Konservierungsmittel für Jauche. (On the action of humus brown coal as a preservative for liquid manure.)** Mitteil. Deutsch. Landw. Ges. 32: 741–743. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 307–311. 1918.—Tests on the humus brown coal showed that it fixed 5.122 per cent of NH_3 while peat fixed only 1.981 per cent. Sixty per cent additions of the coal was found to conserve 50 to 60 per cent of strongly fermenting manure. In the (stable runnings) ('gauche') treated with brown coal the author found 4.41 grams of total nitrogen (in 500 cc. of the liquid) while in material not so treated he found only 0.375 grams of total nitrogen. For a cubic meter of liquid manure 2000 lbs. of brown coal is required. Experiments with beets using conserved liquid manure as a source of nitrogen compared favorable with similar experiments in which ammonium sulphate was used.—*F. M. Schertz.*

1769. Metge, G. [Rev. of: Wagner, P. **Wie wirkt die Saatgutbeschaffenheit auf den Kartoffelertrag unter dem Einfluss verschiedener Pflanzweite, Güngung and Jahreswitterung. (Influence of the seed stock on the yield of potatoes under the influence of different distance of planting, manuring and weather.)** Deutsch. Landw. Presse 45: 169, 175–176, 183. 1918.] Biedermann's Zentralbl. Agrikulturchem. 47: 325–333. 1918.—See Bot. Absts. 3, Entry 1386.

1770. Miller, H. G. **Relation of sulphates to plant growth and composition.** Jour. Agric. Res. 17: 87–102. *Pl. 9–12.* 1919.—Sodium sulphate, calcium sulphate and sulphur were added separately to beaver-dam, loam and clay-adobe soils. Red clover, oats and rape were grown in small pots of these treated soils in a greenhouse. The sulphur, together with calcium carbonate, was added to the soils when planting the seed. The sulphates were distributed by daily applications in solution. Nitrogen was supplied from a solution of sodium

nitrate. Other cultures were conducted in sand, with the addition of sterilized (boiled) extracts of the soils, together with nutrient salts.—Sulphur and sulphates enhanced growth. These effects in the sand cultures are attributed to direct effects of sulphur compounds upon the plants. Clover responded most, having increased nitrogen content and development of roots and nodules where sulphur and sulphates were applied. The latter effects are ascribed to stimulation of nitrogen-fixing bacteria. Alfalfa from field plots to which sulphur had been applied contained more nitrogen and organic compounds of sulphur than that from control plots. The former also contained inorganic sulphates, while the latter contained none.—*W. E. Tottingham.*

1771. PETHYBRIDGE, G. H. **Investigations on potato diseases.** Jour. Dept. Agric. Ireland 19: 271–292. *Fig. 1–2.* 1919.

1772. PESCOTT, EDWARD E. **The Australian flora from an ornamental aspect.** Jour. Dept. Agric. Victoria 17: 360–364. *Pl. 4.* 1919.—See Bot. Absts. 3, Entry 2279.

1773. PICKERING, SPENCER. **The action of one crop on another.** Jour. Roy. Hortic. Soc. 43: 372–380. *Fig. 54–59.* 1919.—The author points out that the growth of plants in soil produces a toxic substance which appears to have a deleterious effect on vegetation. This condition is brought about by the decomposition of organic matter, and, since most of the organic matter comes from plant growth, it is natural to suppose that more toxin will be found where plants are growing than where they are not; thus the toxic effect of one plant on another. He goes on to point out that the toxic effect produced is only temporary and that the toxin is later changed into plant food.—The growth of grass around fruit trees produces a toxic effect which is detrimental to the trees. The effect varies under different conditions, but experiments indicate that the effect was independent of the age of the tree.—Heating the soil caused a temporary increase of toxicity, though the ultimate growth of plants in heated soil was greater. What the toxic substance is has not yet been ascertained, but it is not dihydroxystearic acid.—*J. A. Middleton.*

1774. POWERS, W. L. **The improvement of marsh land in western Oregon.** Oregon Agric. Exp. Sta. Bull. 157. *32 p., fig. 1–24.* 1919.—Preliminary surveys indicate that drainage and improvement of most of Oregon's 150,000 acres of marsh land is entirely feasible. Materials, methods and costs for achieving such a result are given. Experiments and successful farming operations in various parts of the state have demonstrated the great value of the land already drained.—*E. J. Kraus.*

1775. SHUTT, FRANK T. **The "alkali" content of soils as related to crop growth.** Agric. Gaz. Canada 6: 8–15. 1919.—The results of the analysis of five series of soil groups are recorded, each series consisting of three groups representative of land upon which (1) there was good growth, (2) there was poor growth, the crop being distressed by alkali and (3) there was no growth, due to excess of alkali. The crops studied were western rye grass, native prairie grass, oats, wheat and onions. Soil samples were taken at various intervals to the depth of 5 feet. The per cent of sodium sulphate, magnesium sulphate, calcium sulphate, sodium carbonate, and the total soluble saline content was determined for each sample. The western rye grass soil series was impregnated with white alkali, the chief constituent being sodium sulphate and the limits of toxicity where growth took place, ranged from 0.117 to 0.980 per cent depending on the depth of sampling. Native prairie grass showed some growth in much heavier concentration ranging from 0.432 to 1.662 per cent. In the wheat series, the limit of tolerance was indicated by a per cent of 0.123 in the first 6 inches of soil. Below that, the sodium sulphate increased rapidly to 0.701 per cent, and all root extension was inhibited. In the oat and onion series, the soil was heavily impregnated with black "Alkali," the characteristic salt of which is sodium carbonate. The concentration of this salt was greater on the surface soil and decreased steadily in the lower samples. The limit of toxicity seemed to be reached in oats at 0.212 per cent and in onions at 0.224 per cent. With the exception of the series upon which wheat was grown, the soils were under irrigation and were located in

Alberta, Saskatchewan, and British Columbia. The work reported is preliminary to the establishment of standards adapted to Canadian conditions, as regards safe limits of alkalinity in the growing of various crops.—*O. W. Dynes.*

1776. WILLIAMS, C. B. **Report of the division of agronomy.** North Carolina Agric. Exp. Sta. Ann. Rept. 41: 22–35. [1919.]—See Bot. Abstr. 3, Entry 1415.

1777. RICHTER. [Rev. of: SZISSL, JOSEF. **Die Phosphorsäure im geglühten Boden.** (Phosphoric acid in ignited soils.) Zeitschr. Landw. Versuchsw. in Österreich 20: 212. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 241–243. 1918.—The phosphoric acid content of the soils was determined both before and after ignition, to determine the relation of organic to inorganic phosphate. In 24 samples analyzed the ignited soils showed from 20 to 40 per cent more phosphoric acid than the unignited ones. The organic phosphoric acid was due to decomposing vegetation. Aso and Yoshida found that, for barley, peas and rape, the nutritive values of lecithin, phytin and nuclein were in this order, that of lecithin being greatest. Lecithin was not inferior to sodium phosphate, phytin was similar to iron or aluminium phosphate, while nuclein had the weakest action. The author favors the view that a certain amount of organic phosphorus compounds is taken up by the plant from the soil.—*F. M. Schertz.*

1778. VOLHARD, J. [Rev. of: STRELL, M. **Neue Wege für die Verwendbarkeit von Abwasserklärschlamm als Düngemittel.** (New ways for the application of waste-water clarification sediment as fertilizers.) Landw. Versuchsst. 90: 257. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 311–313. 1918.—The author gives a historic review of the waste water question. Nitrogen and phosphoric acid in waste-water sediment are in a much less assimilable form than they are in ammonium sulphate, superphosphate and in fish meal. The above sediment is not suitable for plants which have a short growing period as potatoes, beets, and rutabagas. A much greater quantity of sediment must be used than commercial fertilizers. Moisture and additions of lime apparently increase the efficiency of the sediment. Natural sediment contains more moisture, more total nitrogen and more soluble nitrogen than the decreased sediment. The author presents a method for making more quickly available to the plant, the nitrogenous substances in the sediment. He studied the influence of humus substances upon the nitrification of the organic nitrogen compounds. In this connection "hawin," a black brown pasty mass obtained by treating brown coal with NaOH solution, was studied. It dissolves in water to form a deep brown colloidal solution, when 2 to 3 cc. of a 10 per cent solution of "hawin" and 1.5 cc. of a 10 per cent aluminum sulfate solution are added to a liter of water, coarse flocculent particles form at once and envelop the finest and apparently dissolved organic matter of the water and carry it to the bottom. "Hawin" solution was shown to have a favorable action upon the nitrifiability of organic nitrogen compounds and was especially favorable to the activity of the nitrite forming bacteria. Nitrates were demonstrated to be present in the filtrates of the "hawin" sediment but not in such constant quantities as the nitrites. The nitrification of organic nitrogen compounds such as are present in large amounts in waste-waters and in stable manures is decidedly accelerated by the admixture of humus-like substances. With additions of peat nitrification was slight.—*F. M. Schertz.*

FERTILIZATION

1779. ANONYMOUS. **Las cenizas en el cultivo pratense.** [Ashes for clover growing.] La Informacion Agric. [Madrid] 9: 204. 1919.—See Bot. Abstr. 3, Entry 1331.

1780. ANONYMOUS. **Molasses as a fertilizer for cane land.** Australian Sugar Jour. 11: 200. 1919.—Results appear to indicate that the application of molasses has given an increased yield of 3.7 tons of cane per acre.—*E. Koch.*

1781. BROWN, GORDON G. **Experiments with nitrate of soda as a fertilizer for orchards in the Hood River Valley, Oregon.** Proc. Oregon Hortic. Soc. 1918: 107–112. 1919.—See Bot. Abstr. 3, Entry 2318.

1782. BROWN, G. G. **Fertilizer tests for strawberries.** Oregon Agric. Exp. Sta. Bull. 159. *15 p., 8 fig.* 1919.—A three-year test gave varying results when nitrate of soda, superphosphate, or sulfate of potash were used as fertilizers, either singly or in combination. In general the use of clover as a green manure resulted in increased yields. The application of nitrate of soda also increased yields, but it must be used with moderation. Mineral fertilizers can not be depended upon wholly to replace those containing large quantities of organic matter. On the lighter more open soils the latter types of fertilizers are indispensable. The kinds and amounts of fertilizers to be employed must be judged from strictly local conditions. —*E. J. Kraus.*

1783. METGE, G. [Rev. of: CLAUSEN. **Das Kalk- und Kalibedürfnis der Hülsenfrüchte.** (Lime and potash requirements for the legumes.) Illustr. Landw. Zeitg. 37: 547–549. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 313–318. 1918.—In general the yield of leguminous crops is increased by additions of lime and potash. Tables are given showing the yield from various fertilizer treatments (phosphoric acid, potash, and nitrate) on different types of soil.—Thomas slag, kainit, and ammonium sulphate were some of the fertilizing materials used.—*F. M. Schertz.*

1784. CRUZ, JOSE. **El abonado de la remolacha.** [Fertilization of the sugar beet.] Informacion Agric. [Madrid] 9: 171–173. 1919.—For every hundred kilograms of sugar produced fourteen kilograms of mineral salts are drawn from the soil, and chemical fertilizers are needed to supply these elements. A series of experiments with sodium nitrate indicated that average soils require 50 to 100 kgm. per hectare and up to 500 for poorer soils, an excess lowering the sugar content of the beets and the purity of the juice.—*John A. Stevenson.*

1785. DOMINGO, M. GIL. **El empleo de abonas quimicas en los naranjas.** [Chemical fertilizers for oranges.] Informacion Agric. [Madrid] 9: 60–61. 1919.—See Bot. Abstr. 3, Entry 2328.

1786. GUZMANES, ANTONIO. **El abono del pimiento.** [Fertilization of the pepper.] Informacion Agric. [Madrid] 9: 191–192. 1919.—War made the importation of guano difficult and chemical fertilizers were substituted in Spain. The average yield obtained with peppers (20,000 to 25,000 kgm. per hectare) required 400 kgm. of sodium nitrate and 500 of superphosphate or equivalent. Potash was desirable but unobtainable.—[See Bot. Abstr. 3, Entry 2387.] *John A. Stevenson.*

1787. MCCOOL, M. M., G. N. GRANTHAM, AND C. E. MILLAR. **Some information and suggestions concerning the use of phosphorus.** Michigan Agric. Exp. Sta. Bull. 284. *30 p., 21 fig.* 1919.—A discussion of the phosphorus needs of Michigan soils as demonstrated by fertilizer experiments with and without phosphorus in different parts of the state. It is recommended that this element be applied to sand, loam, clay and muck soils when experiments show an absence of sufficient phosphorus.—*E. A. Bessey.*

1788. MURRAY, J. C. **Molasses as a fertilizer.** Australian Sugar Jour. 11: 189. 1919.—Reports success in the use of molasses as a fertilizer in Australia.—*E. Koch.*

1789. RICHTER. [Rev. of: GREISENEGGER, IGNAZ K. **Versuch mit Samenrüben unter Verwendung von Mangansulfat als Katakytischem Dünger.** (Experiments on seed beets using manganese sulfate as a catalytic manure.) Oesterreich-Ungar. Zeitschr. Zuckerindust. und Landw. 1917: 13, 1917.] Biedermann's Zentralbl. Agrikurchem. 47: 320–324. 1918.

1790. Schatzlein. [Rev. of: Sidenius, E. **Düngungsversuche zu Tabak 1915 bis 1916. (Fertilizer experiments on tobacco, 1915–1916.)** Mededeel. Proefstat. Vorstenlandsche Tabak 26: 1916.] Biedermann's Zentralbl. Agrikulturchem. 47: 318–320. 1918.—Ammonium sulphate in tobacco culture gave good results. Six grams per plant gave 17.6 per cent, 10 grams gave 15.3 per cent and 16 grams 21.4 per cent increase. The quality was better and the leaves were longer than in tobacco grown in unfertilized soil. The burning was affected detrimentally to only a very slight degree. The poor burning quality of tobacco grown on fields fertilized with barnyard manure at Kebon-Argoon is ascribed to the chlorine content of the manure. Experiments conducted in other regions of Java have generally given similar results. —*F. M. Schertz.*

1791. Skinner, J. J., and C. F. Noll. **The botanical composition of a permanent pasture as influenced by fertilizers of different compositions.** Soil Sci. 7: 161–179. 1919.—The yield of hay, lime requirement of the soil and botanical composition of the hay from a 6 year fertilizer experiment with grass on Hagerstown loam is reported. The fertilizers used were acid phosphate, sodium nitrate and potassium chloride. Each fertilizer was used alone and in combination of 2's and 3's, the ingredients varying by 10 per cent stages according to a triangular diagram. The yield of hay was greatest on those plots fertilized with mixtures high in nitrogen. Plots receiving mixtures of acid phosphate and potassium chloride, but no sodium nitrate, show the highest lime requirement. The original composition of the vegetation was Canada blue grass, Kentucky blue grass and white and red clover. At the end of 7 years Kentucky blue grass has become predominent. Clover has been crowded out of plots receiving high ratios of nitrogen, the largest amount of clover occurring in the no-nitrogen series of plots.—*William J. Robbins.*

1792. Volhard, J. [Rev. of: Pfeiffer, Th., and W. Simmermacher. **Über die Wirkung des Dicyandiamids auf das Pflanzenwachstum. (The action of dicyandiamide on the growth of plants.)** Landw. Versuchsst. 90: 415–430. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 243–246. 1918.—The germination of oats is not affected by considerable quantities of dicyandiamide but the growth of the plants and the yield of the grain are seriously injured. The quantity of dicyandiamide found in crude calcium cyanamide is quite small but the substance should be considered as an impurity that may possibly have an injurious effect on the crops.—*F. M. Schertz.*

FERTILIZER RESOURCES

1793. Anonymous. **El precio de los abonos quimicos.** [Price of chemical fertilizers.] Informacion Agric. [Madrid] 9: 97–98. 1919.—Prices and stock on hand in France are compared with conditions in Spain.—*John A. Stevenson.*

1794. Anonymous. **Nuevo procedimiento de obtencion artificial de sales potasicas. [New methods for obtaining potash salts artificially.]** Informacion Agric. [Madrid] 9: 145–146. 1919.—An account of the new methods devised in the United States and Great Britain for obtaining potash from smelter and cement plant waste.—*John A. Stevenson.*

1795. Blanck. [Rev. of: Blanck, E. **Der Phonolith ein Stickstoffdünger. (Is phonolith a nitrogenous fertilizer?)** Landw. Versuchsst. 90: 33. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 283. 1918.

1796. Blanck. [Rev. of: Blanck, E. **Beiträge zum bakteriologisch-chemischen Umsatz der Milcheiweissstoffe, insbesondere Galalith, im Boden. (Contribution on the bacteriological-chemical exchange of milk proteins, especially galalith, in soils.)** Landw. Versuchsst. 90: 17. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 283–284, 1918.—A very favorable result is reported by using galalith as a source of nitrogen for field crops. Experiments on the decomposition of protein of galalith (a by-product of milk) were carried out in a sandy soil. No nitrification of the split off ammonia was observed. The galalith served as a constant source of nitrogen for the growing plants.—*F. M. Schertz.*

1797. DE CASTELLA, F. **Potash manures—sulphate or muriate?** Jour. Dept. Agric. Victoria 17: 369–370. 1919.—A discussion of the relative efficiency of the sulphate and chloride of potash for agricultural purposes. The sulphate is concluded to be the best.—*J. J. Skinner.*

1798. GAVILAN, JUAN. **Nitrato de sosa de Chile.** [Chilean nitrate.] Informacion Agric. [Madrid] 9: 25–29. *5 figs.* 1919.—An account of the exploitation of the Chilean nitrate deposits. A resumé of experiments with the salt is given showing increased yields of cereals, alfalfa, olives, grapes, and onions.—*John A. Stevenson.*

1799. METGE, G. [Rev. of: POPP, M. **Düngungsversuche mit verdorbenem Kalkstickstoff. (Research on fertilizing with damaged crude calcium cyanamide.)** Mitteil. Deutsch. Landw. Ges. 32: 776–780. 1918.] Biedermann's Zentralbl. Agrikulturchem. 47: 299–307. 1918.—The author shows that the injurious action of old calcium cyanamide is due to the dicyandiamide set free. The calcium cyanamide takes up water and is decomposed into dicyandiamide and urea or ammonia. The author carried out pot experiments on moor soil with old and fresh calcium cyanamide, ammonium chloride, ammonium sulphate, urea, urea nitrate and other nitrogeneous substances. The review contains the results of a series of experiments on the growth of oats in potted moor soil which had been variously treated. The old or dicyandiamide-rich calcium cyanamide gave a higher nitrogen content in the oats straw. Two series of garden experiments also were carried out in the year 1916, using potatoes. Plots with calcium cyanamide gave only little better yield than untreated plots. Urea nitrate gave the most favorable yield with the "Gertrude" variety, while urea gave a higher yield with "Roode Staar." In experiments with cabbage the presence of dicyandiamide caused the edges of the leaves to become white and very clearly injured the growth. [See also next following Entry, 1800.]—*T. M. Schertz.*

1800. MÜLLER, B. [Rev. of: MEYER. **Die Lagerung von Kalkstickstoff in Säcken. (Storage of crude calcium cyanamide in bags.)** Illustr. Landw. Zeitg. 58: 347. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 286–287. 1918.—Calcium cyanamide in storage takes up moisture and carbon dioxide from the atmosphere whereby the weight and volume increases, the material hardens and sticks together. Decomposition sets in and a considerable quantity of dicyandiamide is formed. The calcium cyanamide must not be stored in jute sacks, for the alkali in the fertilizer affects the sacks and, further, the taking up of water and carbon dioxide causes the fertilizer to expand and burst the sacks. When stored in paper or jute sacks, in 8 weeks the increase in weight was 10.9 per cent, and in 21 weeks 11.7 per cent.—Calcium cyanamide from the outer layer of the sack showed 10.93 per cent of nitrogen while samples from the middle showed 14.31 per cent. The outer layer increased 36.1 per cent in weight while the middle increased 4.0 per cent; 7.9 per cent of the outer layer had changed into dicyandiamide while in the middle 3.5 per cent had so changed. Decomposition was greater during the warmer months. Storage in a heap is recommended, in a dry place, the pile being covered with Thomas slag, layers of dry fertilizer sacks or dry peat. [See also next preceding Entry, 1799.]—*F. M. Schertz.*

SOIL CLASSIFICATION

1801. BLANCK. [Rev. of: VON HORVÁTH, BÉLA. **Über die Einteilung der Böden nach ihrer elektrischen Leitfähigkeit. (Classification of soils according to their electrical conductivity.)** Internat. Mitteil. Bodenk. 6: 231. 1916.] Biedermann's Zentralbl. Agrikulturchem. 47: 283. 1918.—Conductivities of soils were compared with the soil types. For several reasons classification of the soils by their conductivity is questioned.—*F. M. Schertz.*

1802. TORES, FRANCISCO. **Clasificacion de los terrenos.** [Classification of soils.] Informacion Agric. [Madrid] 9: 105. 1919.—Soils are classified as sandy, calcareous, clay, loam, and saline. The natural vegetation occurring on each type in Spain is given, together with the fertilizing elements required by various cultivated crops.—*John A. Stevenson.*

NITRIFICATION

1803. Greaves, J. E., and E. G. Carter. **Action of some common soil amendments.** Soil Sci. 7: 121–160. 1919.—To tumblers each containing 100 g. of soil and 2 per cent of dried blood, the chlorides, carbonates, and nitrates of sodium, potassium, calcium, magnesium, manganese, and iron, and the sulfates of calcium, magnesium, manganese and iron, were added singly in amounts which had been found to produce the maximum nitrification and ammonification. After 21 days incubation the water-soluble phosphorus and the organic phosphorus were determined. Many of the above salts increased the water soluble phosphorus, the organic phosphorus or both. The increased crop growth noted from the use of the above soil amendments can be accounted for by the increase in available nitrogen or phosphorus.—*William J. Robbins.*

1804. Metge, G. [Rev. of: Kuhn, A. **Über die Impfung von Getreide, Hackfrüchten und anderen Kulturpflanzen mit "U-Kulturen."** (The inoculation of cereals, etc.) [Deitsch. Landw. Presse **44**: 467–468. 1917.] Biedermann's Zentralbl. Agrikulturchem **47**: 261–263. 1918.—The author claims that his product *U Kulturen* (Universal-Kulturen) gave favorable results in field experiments. The product is a mixed culture intended for use on non-leguminous plants.—*F. M. Schertz.*

1805. Volhard, J. [Rev. of: Arnd, Th. **Über die Entstehungsweise salpeter- und salpetrigsaurer Salze in Moorböden.** (The origin of potassium nitrate and nitric acid in moor soils.) Landw. Jahrb. **51**: 297–328. 1917.] Biedermann's Zentralbl. Agrikulturchem. **47**: 291–294. 1918.—The author reviews the works of Ritter in regard to the origin of nitrates in soils. He made qualitative tests, before and after inoculation of sterilized soils, for NH_3, KNO_3 and HNO_3. Nitrates do not arise alone from chemical reactions in the soil but in general nitroso- and nitro-bacteria give rise to them. The author emphasizes need of further work on the activity of soil bacteria.—*F. M. Schertz.*

1806. Volhard, J. [Rev. of: Münter, F. **Über Sorption und Nitrifikation von Ammonverbindungen bei Gegenwart von Zeolithen im Boden, sowie über Ammoniakbestimmungen im Boden und über zeolithartige Substanzen.** (On the absorption and nitrification of ammonia compounds in the soil when zeolite is present, also estimation of ammonia and zeolite substances in the soil.) [Landw. Versuchsst. 90: 147. 1917.] Biedermann's Zentralbl. Agrikulturchem. **47**: 289–291. 1918.—Some authors ascribe the absorption of ammonia salts in the soil to zeolite which was present only in small amounts. Experiments were conducted by adding zeolite (1–2 per cent) to the soil. Nitrogen compounds were then added in the form of corn meal or ammonium sulphate. Ammonification and nitrification in a sandy soil with zeolite corresponded to that in a clay soil. Author also estimated the ammonia present in the soils. By direct distillation of the soil, ammonia was not set free without decomposing nitrogenous bodies in the soil. The greatest differences were found when distillation took place with magnesium oxide and potassium chloride. Absorption then must be conditioned by other substances than zeolite. It was further shown that the differences did not depend upon denitrification, for total nitrogen estimations showed that no nitrogen was lost. The author also worked on zeolite and its related compounds. The capacity of soils for combination with ammonia salts seems to be closely related to the colloidal state.—***F. M. Schertz.***

TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

GENERAL

1807. ADAMSON, R. S. **Notes on the flora of northern Cheshire.** Jour. Botany 57: 91–94. 1919.—The result of excursions during the last three years. A long list of rarities is given, with many notes as to their occurrence.—*K. M. Wiegand.*

1808. CHASE, AGNES. **Some causes of confusion in plant names.** Jour. Forestry 17: 159–162. 1919.—Two causes are ascribed to the differences in plant names; first, the difference between the early and the present day concepts of a genus; second, the relative isolation of the workers. The present system of basing names on priority and basing the genus on a type species is doing much to bring harmony.—*E. N. Munns.*

1809. HAYATA, BUNZŌ. **Icones plantarum Formosanarum nec non et contributiones ad floram Formosanam.** [Illustrations of plants of Formosa and also contributions to the flora of Formosa.] *Roy. 8vo. Vol. VIII, p. 1–164, pl. I–XV.* Bureau of Productive Industries: Taihoku, March 25, 1919.—The present volume contains the results of further investigations on the flora of Formosa, and includes the descriptions of 111 new species and 17 new varieties of flowering plants and ferns, distributed among several families, chiefly in the Compositae, Rutaceae, Labiatae, Urticaceae, and Polypodineae.—*J. M. Greenman.*

1810. HILL, ALBERT FREDERICK. **Vascular flora of the Penobscot Bay region.** Proc. Portland Soc. Nat. Hist. 3: 199–304. *6 fig., 1 map.* 1919. A statement of the "general features of the region" precedes an enumeration of the vascular plants collected. A total of 747 species, varieties, and forms are recorded for the region concerned and 612 of these are indigenous and 135 are introduced plants. The author then follows with a discussion of the "phytogeographical aspects of the flora."—*J. M. Greenman.*

1811. HOLMBERG, OTTO R. **En ny handbok i Skandinaviens flora.** [A prospective Scandinavian flora.] Bot. Notiser 1918: 306–308. 1918.—A notice and description of a prospective new flora of Scandinavia.—*P. A. Rydberg.*

1812. SCHAFFNER, JOHN H. **Additions to the catalog of Ohio vascular plants for 1918.** Ohio Jour. Sci. 19: 293–298. 1919.—This annual list includes 88 species.—*H. D. Hooker, Jr.*

1813. VUILLEMIN, PAUL. **Les principes de la classification botanique.** [The principles of botanical classification.] Compt. Rend. Acad. Sci. Paris 167: 449–453. 1918.

1814. VUILLEMIN, PAUL. **Classification des Dicotyledones. Haplogones.** [Classification of the dicotyledons. Haplogones.] Compt. Rend. Acad. Sci. Paris 167: 477–481. 1918.

1815. VUILLEMIN, PAUL. **Classification des Dicotyledones. Anthogones.** [Classification of the dicotyledons. Anthogones.] Compt. Rend. Acad. Sci. Paris 167: 510–514. 1918.

PTERIDOPHYTES

1816. ANONYMOUS. **Large ebony spleenworts.** Amer. Bot. 25: 60, 1919.—Specimens of *Asplenium ebenum* more than 25 inches long are recorded.—*W. N. Clute.*

1817. DE BARNOLA, P. J. **Las Licopodiales de la Peninsula Iberica citas y notas criticas.** [The Lycopodiales of the Iberian Peninsula with citations and critical notes.] Broteria Ser. Bot. 17: 17–27. 1919.

1818. FABR, C. H. **The ferns of the rain-forest.** Sci. Monthly 9: 19–31. *30 fig.* 1919.

1819. Hayata, Bunzô. **Protomarattia, a new genus of Marattiaceae, and Archangiopteris.** Bot. Gaz. 67: 84–92. *1 pl., 3 text fig.* 1919.—*Protomarattia tonkinensis* is described and illustrated as a new genus and species of the Marattiaceae, from Monte Tamdao (Tonkin), China. Four species of *Archangiopteris* are recognized namely, *A. subintegra*, *A. tamdaoensis* Hayata, spp. nov. and *A. Henryi* Christ from China, also *A. Somai* Hayata from Formosa. [See Bot. Absts. 3, Entry 1283.]—*J. M. Greenman.*

1820. Maxon, W. R. **A new Cheilanthes from Mexico.** Proc. Biol. Soc. Washington 32: 111–112. 1919.—*Cheilanthes castanea* Maxon is described as a new species.—*J. C. Gilman.*

1821. Maxon, W. R. **A new Alsophila from Guatemala and Vera Cruz.** Proc. Biol. Soc. Washington 32: 125–126. 1919.—*Alsophila scabriuscula* Maxon is described as a new species from Alta Verapaz, Guatemala, and Vera Cruz.—*J. C. Gilman.*

SPERMATOPHYTES

1822. Abrams, L. R. **A new California cypress.** Torreya 19: 92. 1919.—The note describes *Cupressus nevadensis* sp. nov. This was first discovered by Mrs. Polkinghorn on Red Hill, Piute Mts., near Bodfish, Kern Co., Cal., in 1907, and was again collected by the author in 1915. Its closest relationship is to *C. Sargentii* Jepson.—*J. C. Nelson.*

1823. Blake, S. F. **Revision of Ichthyomethia, a genus of plants used for poisoning fish.** Jour. Washington [D. C.] Acad. Sci. 9: 241–252. 1919.—The trees of this genus are of economic importance among the natives of tropical America who use the bark of the root to poison fish. The timber is also valuable. This paper describes the eight known species of the genus, substituting, in harmony with the American Code of Botanical Nomenclature, the name *Ichthyomethia* for *Piscidia*. Three of the described species are new, and several new combinations have been made.—*Helen M. Gilkey.*

1824. Britton, N. L., and J. N. Rose. **The Cactaceae, descriptions and illustrations of plants of the cactus family.** Vol. 1. Carnegie Inst. Washington [D. C.] Publ. 248. 24 × 30 *cm., vii + 236 p., 36 plates (mostly colored), 301 fig.* August, 1919.—This is the first volume of a monograph of the Cactaceae which is being prepared through a cooperation of the Carnegie Institution of Washington, the New York Botanical Garden, the U. S. National Museum and the U. S. Department of Agriculture. The monograph is to include the results of special exploration and is to give special attention to habitat and relations to other species. The present volume deals with the Pereskieae and Opuntieae. Illustrations are very numerous, both photographs and drawings.—*B. E. Livingston.*

1825. Detmers, Freda. **Two new varieties of Acer rubrum L.** Ohio Jour. Sci. 19: 235–239. *Pl. 12–13.* 1919.—Two trees found on Cranberry Island, Buckeye Lake, Ohio, are designated as *Acer rubrum* L. var. *viride* and *Acer rubrum* L. var. *rubrocarpum*. Detailed descriptions of each variety are given and a key to the section *Rubra* of the genus *Acer* in the United States is appended.—*H. D. Hooker, Jr.*

1826. Griffiths, David. **New and old species of Opuntia.** Bull. Torrey Bot. Club 46: 195–206. *Pl. 9–10.* 1919.—The following new species of *Opuntia* are described: *O. effulgia*, *O. cyanea*, *O. diversispina*, *O. hispanica*, *O. chata*, *O. Maideni*, *O. oborata*, *O. amarilla*. Two species of the same genus, *O. Bartrami* Raf. and *O. maritima* Raf. are "recognized for the first time since originally described."—*P. A. Munz.*

1827. Hedlund, T. **Upprop. [A request].** Bot. Notiser 1919: 103–104. 1919.—Mr. Hedlung requests Swedish botanists to corroborate by field study his contention that the cultivated *Ribes rubrum* L. is really a native of Sweden, and as common in the wild state as any other of the Swedish species of red currants, and should retain its usual name *R. rubrum*. Janczewski has claimed that it is not a native of Sweden and that the name *R. rubrum*, under which Linnaeus included several species, should be applied to a native species. He, therefore, applied it to *R. Schlechtendalii*, a treatment to which Mr. Hedlund objects.—*P. A. Rydberg.*

1828. HITCHCOCK, A. S. **A peculiar species of Lasiacis.** Jour. Washington [D. C.] Acad. Sci. 9: 35–38. 1919.—The genus *Lasiacis*, belonging to the tribe Paniceae, includes 13 species of grasses of tropical and semi-tropical America. All specimens from Trinidad, the lower Orinoco, and eastern Brazil, studied by the author, were found to possess a second sterile lemma in addition to the usual sterile lemma characteristic of the tribe. In the possession of this character, the plants of this region differ from all other known specimens representing the genus, though in other respects they resemble *Lasiacis ruscifolia* (HBK.) Hitchc. & Chase (*Panicum compactum Swartz*) to which they were formerly referred. On the basis, therefore, of distinct geographical range and uniformity in the possession of a second sterile lemma, they are raised to specific rank under the name *Lasiacis anomala*.—*Helen M. Gilkey.*

1829. HOLMBERG, OTTO. **Glyceria aquatica—en nomenculturefråga. [Glyceria aquatica. A question of nomenclature.]** Bot. Notiser 1919: 95–98. 1919.—According to the author, the plant usually known as *Glyceria aquatica* (L.) Wahl. 1820 (not *G. aquatica* (L.) Presl) should be known as *Glyceria maxima* (Hartm.) Holmberg, n. comb., and the one usually known as *Catabrosa aquatica*, if included in *Glyceria*, should become *Glyceria dulcis* (Salisb.) Holmberg.—*P. A. Rydberg.*

1830. LAM, H. J. **The Verbenaceae of the Malayan Archipelago, together with those from the Malayan Peninsula, the Philippines, the Bismarck Archipelago, and the Palau, Marianne, and Caroline Islands.** *8 vo. 370 p., 3 pl.* M. de Waal: Groningen, 1919.—A monographic treatment of the family for the area covered with descriptions, keys to the genera and species, and citation of specimens. Twenty-eight genera are recognized, of which **Viticipremna** and **Xerocarpa** are proposed as new. Numerous new species are described in the following genera: *Guensia* (1), *Callicarpa* (1), *Xerocarpa* (1); *Premna* (12), *Vitex* (2), *Gmelina* (3), *Faradaya* (2) and *Clerodendron* (4). New names and new combinations appear in various genera.—*E. D. Merrill.*

1831. LINDSTRÖM, A. Å. **Om slägtet Rosa.** Bot. Notiser 1919: 149–151. 1919.—The author suggests a double set of characters to be used artificially in determining the species of *Rosa*. First, whether the base of the leaflets is broad, *i.e.* rounded, truncate, or cordate, or narrow, *i.e.* cuneate or tapering. Secondly, whether the teeth are directed forward and usually incurved, or salient. By combining the two sets of characters, four types of leaflets are recognized, which he denotes by the Greek letters α, β, γ, and δ.—*P. A. Rydberg.*

1832. MORVILLEZ, F. **L'appareil conducteur des feuilles des Saxifragacées. [The conducting organs of the leaves of the Saxifragaceae.]** Compt. Rend. Acad. Sci. Paris 167: 555–558. *1 fig.* 1919.—See Bot. Absts. 2, Entry 71.

1833. PIPER, C. V. **New Pacific Coast plants.** Proc. Biol. Soc. Washington [D. C.] 32: 41–44. 1919.—The following plants found in western United States are described as new species: *Sidalcea Nelsoniana, Cryptantha suffruticosa, Stachys caurina, Stachys confertiflora, Pentstemon deserticola, Cirsium oreganum, Stachys ciliata macrantha* is described as a new subspecies from British Columbia.—*J. C. Gilman.*

1834. PLEIJEL, CARL. **Valeriana excelsa Poir. X officinalis L. nova hybrida.** [Swedish with diagnosis in Latin.] Bot. Notiser 1918: 295–296. *Fig. 1–3.* 1918.—*P. A. Rydberg.*

1835. ROWLEE, W. W. **Synopsis of the genus Ochroma, with descriptions of new species.** Jour. Washington [D. C.] Acad. Sci. 9: 157–167. 1919.—The wood of *Ochroma*, commonly called "balsa wood," has become widely known during the past few years through its utilization for war purposes. Its light weight has fitted it for use in life-boats, life-rafts, and aeroplanes. The results of seven months' study in Central America where the author was sent to investigate the quality and quantity of balsa wood are set forth in this paper. Nine species are described, 7 new species added to the 2 previously known. Balsa is a conspicuous tree of tropical America, sometimes occurring as isolated individuals in forests but more often as abundant second growth in clearings. It is one of the most rapid-growing trees known.—*Helen M. Gilkey.*

1836. Safford, W. E. **Notes on the genus Dahlia with descriptions of two new species from Guatemala.** Jour. Washington [D. C.] Acad. Sci. 9: 364–373. *4 pl., fig. 1–4.* 1919.—The genus *Dahlia* should be carefully revised with the work based upon material collected in Mexico and Central America, where these plants are endemic, rather than upon garden-grown material as heretofore. Specimens recently collected in those regions throw new light upon the origin of many of our garden forms, while illustrations made in 1575 by a Spanish explorer indicate that "double-flowered" dahlias are normal and not the creation of modern horticulturalists from "single-flowered" types, as generally supposed. The new species proposed in this paper are: *Dahlia Popenovii* and *D. Maxonii.*—*Helen M. Gilkey.*

1837. Sargent, C. S. **Notes on North American Trees. IV.** Bot. Gaz. 67: 208–242. 1919.—The present article contains critical notes and distributional data on several species of trees, new combinations, and descriptions of new species, varieties, and hybrids, as follows: *Picea glauca* var. *albertina* (*P. canadensis* var. *albertina* Rehder), *Juniperus utahensis* var. *megalocarpa* (*J. megalocarpa* Sudworth), *Populus tremuloides* var. *vancouveriana* (*P. vancouveriana* Trelease), *P. arizonica* (*P. mexicana* Sargent, not Wesmael), *P. arizonica* var. *Jonesii*, *P. Palmeri*, *P. texana*, *P. Fremontii* var. *Thornberii*, *P. Fremontii* var. *pubescens*, *P. Fremontii* var. *Toumeyi*, *P. Parryi* (*P. Fremontii* x *trichocarpa*), *Ostrya virginiana* var. *glandulosa*, *Betula Eastwoodae*, *B. commixta* (*B. alaskana* x *glandulosa*), *Celtis occidentalis* var. *canina* (*C. canina* Raf.), *C. reticulata* var. *vestita*, *C. laevigata* var. *Smallii*, *C. laevigata* var. *texana* (*C. texana* Scheele), *C. laevigata texana* f. *microphylla*, *C. laevigata* var. *brachyphylla*, *C. laevigata* var. *anomala*, *C. laevigata* var. *brevipes* (*C. brevipes* Wats.), *C. pumila* var. *georgiana* (*C. georgiana* Small), *C. pumila* var. *Deamii*, *Platanus occidentalis* f. *attenuata*, *P. occidentalis* var. *glabrata* (*P. glabrata* Fernald), *Magnolia virginiana* var. *australis*, *M. acuminata* var. *ludoviciana*, *Acer saccharum* var. *glaucum*, (*A. saccharinum* var. *glaucum* Pax), *A. saccharum* var. *sinuosum* (*A. sinuosum* Rehder), *A. rubrum Drummondii* f. *rotundata*, *A. Negundo* var. *texanum* f. *latifolium* (*A. Negundo* var. *latifolium* Pax), *A. Negundo* var. *interior* (*A. interior* Britton), *A. Negundo* var. *arizonicum*, *Fraxinus americana* var. *subcoriacea*, and *Castanea alnifolia* var. *floridana.*—*J. M. Greenman.*

1838. Schneider, Camillo. **Notes on American willows. III. A conspectus of American species and varieties of sections Reticulatae, Herbaceae, Ovalifoliae, and Glaucae.** Bot. Gaz. 67: 27–61. 1919.—Thirty-two species are included in the present consideration of the above sections. The enumeration and description of the sections and species is preceded by two keys —one to the female plants and one to the male plants. The following new species, varieties, and forms are characterized: *Salix nivalis* Hook. var. *saximontana*, *S. rotundifolia* Trautvetter forma *pilosiuscula*, *S. arctophila* Cock. var. *lefocarpa* (*S. groenlandica* var. *lejocarpa* Lange), *S. hudsonensis*, and *S. glauca* var. *acutifolia* (Hook.) Schn. forma *poliophylla.*—*J. M. Greenman.*

1839. Schneider, Camillo. **Notes on American willows. IV. Species and varieties of section Longifoliae.** Bot. Gaz. 67: 309–346. 1919.—The present paper deals with a distinctly American group of willows which are assembled under the sectional name *Longifoliae*. Eight species and eight varieties are recognized. The following are designated as new varieties or new combinations: *Salix exigua* Nutt. var. *nevadensis* (*S. nevadensis* Watson), *S. exigua* var. *lutosericea*, *S. exigua* var. *tenerrima* (*S. longifolia* var. *tenerrima* Henderson), *S. melanopsis* Nutt. var. *Bolanderiana* (*S. longifolia* Bebb, in part, not Muhl.), *S. longifolia* Muhl. var. *Wheeleri* (*S. interior* var. *Wheeleri* Rowlee).—*J. M. Greenman.*

1840. Stapf, Otto. **Gramineae.** Flora of Tropical Africa 9²: 385–576. 1919.—This part concludes the account of Andropogoneae and commences that of the Paniceae, ending in the midst of *Paspalum*. *Digitaria* is a large genus with 49 species; *Alloteropsis* is based on *Panicum semialatum* R. Br. and includes *Coridochloa* Nees (distinct in the key to genera); *Pseudechinolaena* is based on *Echinolaena polystachya* HBK (*Panicum uncinatum* Raddi) and distinguished from *Echinolaena* (*E. inflexa* Chase, *E. hirta* Desv.); *Brachiaria*, distin-

guished by the secund spikelets adaxial on the rachis (abaxial in *Paspalum* and species of *Panicum* with racemose spikelets), and based on *B. erucaeformis* (Sibth. & Smith) Griseb. (Stapf uses *B. Isachne* Stapf based on *Panicum Isachne* Roth), includes 56 species, among which are *B. mutica* (*Panicum muticum* Forsk., *P. numidianum* Lam., *P. barbinode* Trin.), called Para grass in America; *Axonopus* is based on *A. compressus* Beauv. (*Paspalum compressum* Rasp.); *Paspalum* includes only 5 species.

The new genera, species, and varieties of part 2, issued in 1918, and of the present part are as follows:

Part 2. *Schizachyrium nodulosum* (*Andropogon nodulosus* Hack.), *S. griseum*, *S. semiberbe* Nees var. *flocculiferum*, *S. semiberbe* Nees var. *hemileium* (*Andropogon hirtiflorus* Rendle, not Kunth), *S. ursulus*, *S. Jeffreysii* (*Andropogon Jeffreysii* Hack.), *S. Schweinfurthii* (*Andropogon Schweinfurthii* Hack.), *S. Thollonii* (*Andropogon Thollonii* Franch.), *S. compressum* (*Andropogon compressus* Stapf), *S. scintillans*, *S. pulchellum* (*Andropogon pulchellus* D. Don), *S. Kelleri* (*Andropogon Kelleri* Hack.), *S. rupestre* (*Andropogon rupestris* K. Schum.), *Andropogon Lima* (*Andropogon amethystinus* var. *Lima* Hack.), *A. pilosellus*, *A. homogamus*, *A. calvescens*, *A. Stolzii*, *A. purpureus*, *A. laxatus*, *A. laxatus var. ligulata*, *A. linearis*, *A. pseudapricus* (*Andropogon apricus* var. *africanus* Hack.), *A. amplectens* Nees var. *diversifolius* (*A. diversifolius* Rendle), *A. Dummeri*, *A. Dummeri* var. *calvus*, *A. Pseudo-Schinzii*, *A. canaliculatus* Schumach. var. *fastigians* and var. *Fyffei*, *A. tumidulus*, *A. Macleodiae*, *A. auriculatus*, *A. gayanus* Kunth var. *squamulatus* (*A. squamulatus* Hochst.), *A. macrophyllus*, *Cymbopogon proximus* (*Andropogon proximus* Hochst.), *C. floccosus* (*Andropogon floccosus* Schweinf.), *C. divaricatus*, *C. afronardus*, *C. validus* var. *lysocladus*, *C. excavatus* (*Andropogon excavatus* Hochst.), *C. densiflorus* (*Andropogon densiflorus* Steud.), *Hyparrhenia finitima* [Anderss. in Schweinf. Beitr. Fl. Aethop. 300. 306, 1867] (*Andropogon finitimus* Hochst.), *H. gazensis* (*Cymbopogon gazense* Rendle), *H. dichroa* (*Andropogon dichroos* Steud.), *H. rufa* (*Trachypogon rufus* Nees), *H. rufa* var. *major* (*Cymbopogon rufus* var. *major* Rendle), *H. altissima* (*Andropogon altissimus* Hochst.), *H. exarmata* (*Cymbopogon exarmatus* Stapf.), *H. poecilotricha* (*Andropogon poecilotrichus* Hack.), *H. vulpina*, *H. chrysargyrea* (*Cymbopogon chrysargyreus* Stapf), *H. Nyassae* (*Andropogon Nyassae* Rendle), *H. smithiana* (*Andropogon smithianus* Hook. f.), *H. hirta* (*Andropogon hirtus* L.), *H. soluta* (*Cymbopogon solutus* Stapf), *H. soluta* var. *violascens*, *H. bagirmica* (*Cymbopogon bagirmicus* Stapf), *H. grallata*, *H. Barteri* (*Andropogon Barteri* Hack.), *H. Barteri* var. *calvescens* (*Andropogon filipendulus* var. *B calvescens* Hack.), *H. filipendula* (*Andropogon filipendulus* Hochst.), *H. filipendula* var. *pilosa* (*Andropogon filipendulus* var. *pilosus* Hack.), *H. familiaris* (*Andropogon familiaris* Steud.), *H. macrolepis* (*Andropogon macrolepis* Hack.), *H. pseudocymbaria* [Anderss. 1856] (*Anthistiria pseudocymbaria* Steud.), *H. cymbaria* (*Andropogon cymbarium* L.), *H. variabilis*, *H. collina* (*Andropogon collinus* Pilger), *H. spectabilis*, *H. formosa*, *H. elongata*, *H. rudis*, *H. phyllopoda*, *H. arrhenobasis* (*Andropogon arrhenobasis* Hochst.), *H. Lintonii*, *H. cyanescens* (*Cymbopogon cyanescens* Stapf), *H. petiolata*, *H. confinis* var.? *pellita* (*Andropogon confinis* var. *pellitus* Hack.), *H. macrarrhena* (*Andropogon confinis* var. *macrarrhenus* Hack.), *H. Welwitschii* (*Cymbopogon Welwitschii* Rendle), *H. gracilescens*, *H. bracteata* (*Andropogon bracteatus* Humb. & Bonpl.), *H. Lecomtei* (*Andropogon Lecomtei* Franch.), *H. Newtonii* (*Andropogon Newtonii* Hack.) *H. Newtonii* var. *macra*, *H. Stolzii*, *H. cirrosula*, *H. subplumosa*, *H. diplandra* (*Andropogon diplandrus* Hack.), *H. pachystachya*, *H. Gossweileri*, *H. glabriuscula* [Anderss. 1867] (*Andropogon glabriusculus* Hochst.), *H. andongensis* (*Cymbopogon andongensis* Rendle), *H. multiplex* var. *leiopoda*, *H. involucrata*, *H. notolasia*, *H. Cornucopiae* (*Andropogon Cornucopiae* Hack.), *H.* (?) *pusilla* (*Andropogon pusillus* Hook. f.), Dybowskia (new genus) *Serullii* (*Andropogon Dybowskii* Franch)

Part 3. **Monocymbium** (new genus) *ceresiiforme* (*Andropogon ceresiaeformis* Nees), *Anadelphia trepidaria* (*Andropogon trepidarius* Stapf), *A. leptocoma* (*Andropogon leptocomus* Trin.) *A. tenuifolia*, *A. longifolia*, *A. pubiglumis*, *A. hamata*, *A. arrecta* (*Andropogon arrectus* Stapf.), *A. afzeliana* (*Andropogon afzelianus* Rendle), *A. trispiculata*, Monium (new genus) *macrochaetum*, *Trachypogon Thollonii* (*T. polymorphus* var. *Thollonii* Franch.), T. *durus*, *T. planifolius*, Elymandra (new genus) *androphila* (*Andropogon androphilus* Stapf.), *Digi-*

taria milanjiana (*Panicum milanjianum* Rendle), *D. seriata*, *D. macroblephara* (*Panicum macroblepharum* Hack.), *D. Pearsonii*, *D. Perrottetii* (*Panicum Perrottetii* Kunth), *D. marginata* var. *Linkii* and var. *fimbriata* (*D. fimbriata* Link), *D. marginata* var. *nubica*, *D. acuminatissima*, *D. monodactyla* var. *explicata* (*Panicum monodactylum* Eyles), *D. compressa*, *D. nardifolia*, *D. capitipila*, *D. seminuda*, *D. pellita*, *D. Brazzae* (*Panicum Brazzae* Franch.), *D. Lecardii* (*Panicum sanguinale* var. *Lecardii* Pilg.), *D. xanthotricha* (*Panicum xanthotrichum* Hack.), *D. melanochila*, *D. delicatula*, *D. botryostachya*, *D. Hackelii* (*Panicum Hackelii* Pilg.), *D. leptorrhachis*, *D. polybotrya*, *D. nigritiana* (*Panicum nigritianum* Hack.), *D. maniculata*, *D. elegans*, *D. uniglumis* (*Panicum uniglume* A. Rich.), *D. uniglumis* var. *major*, *D. minutiflora* (*Panicum minutiflorum* A. Rich.), *D. Myurus*, *D. intecta*, *Alloteropsis semialata* Hitchc. var. *Ecklonii* (*Axonopus semialatus* var. *Ecklonii* Stapf), *A. angusta*, *A. paniculata* (*Urochloa paniculata* Benth.), *A. cimicina* (*Milium cimicinum* L.), *Microcalamus glaber*, *Pseudechinolaena polystachya* (*Echinolaena polystachya* HBK), *Eriochloa Macclounii*, *Leucophrys glomerata* (*Panicum glomeratum* Hack.), *Brachiaria obvoluta*, *B. dictyoneura* (*Panicum dictyoneuron* Fig. & DeNot.), *B. Rautanenii* (*Panicum Rautanenii* Hack.), *B. hians*, *B. viridula*, *B. filifolia*, *B. falcifera*, (*Panicum falciferum* Trin.), *B. fulva*, *B. brevis*, *B. soluta*, *B. stigmatisata* (*Panicum stigmatisatum* Mez), *B. brevispicata* (*Panicum brevispicatum* Rendle), *B. reticulata*, *B. interstipitata* (*Panicum interstipitatum* Stapf), *B. platytaenia*, *B. vittata*, *B. latifolia*, *B. mutica* (*Panicum muticum* Forsk.), *B. decumbens*, *B. rugulosa*, *B. distachyoides*, *B. dura*, *B. brizantha* (*Panicum brizanthum* Hochst.), *B. callopus* (*Panicum callopus* Pilg.), *B. obtusiflora* (*Panicum obtusiflorum* A. Rich.), *B. nigropedata* (*Panicum nigropedatum* Munro), *B. lachnantha* (*Panicum lachnanthum* Hochst.), *B. serrata* (*Panicum serratum* Spreng.), *B. serrata* var. *gossypina* (*Panicum gossypinum* A. Rich.), *B. brachylopha* (*Panicum brachylophum* Stapf.), *B. arida* (*Panicum aridum* Mez), *B. leucacrantha* (*Panicum leucacranthum* K. Schum.), *B. xantholeuca* (*Panicum xantholeucum* Hack.), *B. ramosa* (*Panicum ramosum* L.), *B. regularis* (*Panicum regulare* Nees), *B. ovalis* (*Panicum ovale* R. Br.), *B. grossa*, *B. serrifolia* (*Panicum serraefolium* Hochst.), *B. pubifolia* (*Panicum pubifolium* Mez), *B. glauca*, *B. leersioides* (*Panicum leersioides* Hochst.), *B. Isachne* (*Panicum Isachne* Roth), *B. poaeoides*, *B. epaleata*, *B. semiundulata* (*Panicum semiundulatum* Hochst.), *B. distichophylla* (*Panicum distichophyllum* Trin.), *B. kotschyana* (*Panicum kotschyanum* Hochst.), *B. andongensis* (*Panicum andongense* Rendle), *B. comata* (*Panicum comatum* Hochst.), *B. jubata* (*Panicum jubatum* Fig. & DeNot.), *Paspalum scrobiculatum* var. *Commersonii* (*Paspalum Commersonii* Lam.).—*A. S. Hitchcock.*

1841. Turesson, Göte. **Grupp- och artbegränsning innom slägtet Atriplex.** [**Limitations of the groups and species of the genus Atriplex.**] Bot. Notiser 1919: 41–47. 1919.—The North European species are placed in three groups, distinguished by the position and shape of the radicle. These groups are represented by, and cluster around, *A. patula*, *A. hastata*, and *A. rosea*. The leaf-form is of little value in the classification, and the shape and the more or less high union of the bracts are, according to the author, not very important. Classification is very difficult, as the species hybridize very readily.—*P. A. Rydberg.*

1842. Wright, C. H. **Disporum pullum var. brunnea.** Curtis's Bot. Mag. 15: *Pl. 8807 (colored).* 1919.—This new variety comes from western Hupeh, China. The perianth segments are purplish-brown, whence the varietal name, and stellately spreading at the tips.—*Oliver A. Farwell.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Burton E. Livingston, *Editor*

1843. Ashe, A. **A new incandescent light for microscopical illumination.** Jour. Quekett Microsc. Club, II, 14: 1–4. *1 fig.* 1919.—The light described is an adaptation of a small acetylene lamp and thoria discs or rolls of mantle material.—*Lera B. Walker.*

1844. C., A. H. [Rev. of: Bower, F. O. **Botany of the living plant.** *580 p. 8vo.* Macmillan & Co.] Jour. Botany 57: 226–229. 1919.

1845. COULTER, JOHN M. **The botanical opportunity.** Science 49: 363–367. April, 1919.—In this address, delivered before the meeting of the American Association for the Advancement of Science at Baltimore, the author calls attention to the necessity of carrying forward the progress which botany has made during the war, and of strengthening the spirit of cooperation which has developed under the stress of war. In connection with the period of reconstruction, a great opportunity has come to botany. A response to this opportunity for public service does not mean *less* science but *more* science. The history of botany shows that the science has been passing through the analytic phase, and the older botany, a term practically synonymous with taxonomy, has been split into a large number of divisions. Segregation and a narrowing of interest have resulted. Now, however, the movement is in the other direction: synthesis of the subject. This synthetic view recognizes not the rigidity of separate fields, but the cooperation of all fields. Botanists should see to it that their science is recognized as the greatest field for universal service; they should emphasize the connection between pure science and applied science; they must see to it that the spirit of competition between individuals, between research institutions, between investigators in other institutions and in the U. S. Department of Agriculture, is replaced by the spirit of cooperation.—*A. H. Chivers.*

1846. FAIRBRIDGE, DOROTHEA. **Food plants and those of economic value.** South African Gard. 9: 235–237. *8 fig.* 1919.

1847. LIVINGSTON, BURTON E. **Some responsibilities of botanical science.** Science 49: 199–207. Feb., 1919.—This is vice presidential address given before Section G, American Association for the Advancement of Science, Baltimore, Dec., 1918. It emphasizes throughout the need for greater cooperation and *esprit du corps* among botanists. Two quite different aims are to be kept in mind by botanists: first, the preservation of botanical knowledge; second, addition to botanical knowledge. For the accomplishment of the first aim, a national or international institute for the furnishing of bibliographical information is needed. Such an institution, furnishing bibliographies on any topic, with or without abstracts, would conserve an enormous amount of time for scientific workers and research institutions. In discussing the second aim the author suggests that scientific research is unorganized and unrecognized as a reputable occupation and that this fact demands serious attention. The planning of research could be more effectively and consistently carried out if greater cooperation existed among competent thinkers; data could be more consistently procured, especially when practical difficulties arise, if the investigator would call upon competent colleagues for advice; the interpretation and presentation of results, too frequently poorly done, could be made easier if the possibilities of cooperation were employed. It seems highly desirable that several competent minds might be asked to make suggestions regarding any research, at several times, from its inception to the publication of the resulting contribution. Finally, attention is called to the fact that botanists, in working over the mass of botanical knowledge for the purpose of presenting it to others, and in selecting lines along which research is to be undertaken, will fail in discharging their responsibilities unless they give special attention to the scientific and philosophical aspects of the application of botanical science to all the various needs of man.—*A. H. Chivers.*

1848. MOORE, GEORGE T. **Botanical participation in war work.** Science 49: 269–274. March, 1919.—The address (read at the symposium of Section G, American Association for the Advancement of Science, Baltimore, Dec., 1918) discusses some aspects of the way in which botany accomplished its full share in the war, and points out the importance of a recognition of the place which the subject should occupy in peace plans. The author calls attention to the services of specialists for their assistance; in suggesting botanical raw materials for the commercial man; in their work in connection with the Bureau of Air Craft Production and the Sanitary Corps; in the perfecting of gas masks; in connection with agriculture. Hundreds, perhaps thousands of determinations of plants have been made since the outbreak of the war for the purpose of giving the manufacturer definite knowledge of the source and value

of fibers, drugs, condiments, gums and other useful products. Some most fundamental and far-reaching results have thus been realized. However, the standing of the botanist as a benefactor of mankind has been little, if at all, changed. Those asking for information of the botanist often give little credit, and the credit due the science is soon forgotten. Some means of obtaining the recognition due botany should be devised. The author points out that it should not be the sole aim of botanical science to be of direct practical application; it would be a catastrophe to neglect pure botany or research. But research must be made worthy of the name.—*A. H. Chivers.*

1849. Park, A. D. **Rural income tax: Specimen return for dairy farmers.** New Zealand Jour. Agric. 18: 288–293. 1919.

1850. Potts, George. **The pepper tree (Schinus Molle) in its relation to epidemic hay fever: Interim Report.** South African Jour. Sci. 15: 525–530. 1919.

1851. Ruthven, Alexander G. **The Edward K. Warren Foundation and two wild life reservations in Michigan.** Science 49: 17–18. Jan., 1919.—An announcement of two wild life preserves, established by Mr. and Mrs. Edward K. Warren of Three Oaks, Michigan, and incorporated in the Edward K. Warren Foundation. The tracts (which are in Berien County) comprise 300 acres (150 or more original forest) near the town of Three Oaks, and over 250 acres in sand dune region on shore of Lake Michigan. Purposes of setting aside these reserves are: that future generations may have example of primitive floral and faunal conditions in southern Michigan; that nature-lovers may be able to find many animals and plants that are being exterminated elsewhere; that students may have available a place where they can study native plants and animals in natural habitats.—*A. H. Chivers.*

1852. Wallis, T. E. **The use of amylic alcohol and sandarac in microscopy.** Jour. Quekett Microsc. Club II, 14: 13–18. 1919.—A mixture of amylic alcohol, sandarac and, castor oil was found to be very useful as a mounting medium, especially for mounts of insects mosses, etc. Directions for its use are given.—*Leva B. Walker.*